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MBA PROFESSIONAL REPORT

Analysis of Aircraft Carrier Excess Material Offloaded to CARP Facilities

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                        June 2011

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The Consumable Asset Reutilization Program (CARP) is an organization established under Naval Supply Systems Command to provide a specific warehousing service for excess material generated by commands operating under the Navy Working Capital Fund. This warehousing service would receive excess consumable material that had possible future demand, and hold that material until demand on that item was realized. Annually, CARP processes approximately 70,000 excess offload transactions from aircraft carriers, amphibious assault ships, and naval air stations. Of the three, aircraft carriers are the largest customer of this service.

This MBA project employs exploratory research to empirically analyze material that is offloaded from aircraft carriers to CARP, and to identify drivers of the high volume of excess consumable material that is generated on-board aircraft carrier inventories. This project proposes policy-level changes to both the allowancing and offload processes for aircraft carriers, and, through statistical modeling and analysis, estimates the outcomes of these changes on inventories and costs.

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ANALYSIS OF AIRCRAFT CARRIER EXCESS MATERIAL OFFLOADED TO CARP FACILITIES

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ANALYSIS OF AIRCRAFT CARRIER
EXCESS MATERIAL OFFLOADED TO THE
CONSUMABLE ASSET REUTILIZATION PROGRAM

ABSTRACT

The Consumable Asset Reutilization Program (CARP) is an organization established under Naval Supply Systems Command to provide a specific warehousing service for excess material generated by commands operating under the Navy Working Capital Fund. This warehousing service would receive excess consumable material that had possible future demand, and hold that material until demand on that item was realized. Annually, CARP processes approximately 70,000 excess offload transactions from aircraft carriers, amphibious assault ships, and naval air stations. Of the three, aircraft carriers are the largest customer of this service.

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LIST OF ACRONYMS AND ABBREVIATIONS

ACC: Aircraft Controlling Custodian

ADA: Acquisition Decision Authority

AECL: Aircraft Equipment Configuration List

AEL: Allowance Equipment List

AIMD: Aircraft Intermediate Maintenance Department

AMD: Average Monthly Demands

AOM: Aviation Operations Maintenance

APN: Aircraft Procurement Navy funds

APL: Allowance Parts List

APML: Assistant Project Manager for Logistics

AQRC: AVCAL Quality Review Conference

AR: Authorized Retention

ASI: Automated Shore Interface

ATAC: Advanced Traceability and Control

ATC: Allowance Type Code

AV-3M: Aviation Material Maintenance Management

AVCAL: Aviation Consolidated Allowance List

BCM: Beyond Capability of Maintenance

BER: Beyond Economic Repair

BP: Budget Project

CAB: Centralized Accounting and Billing database

CARP: Consumable Asset Reutilization Program or Consumable Asset Redistribution Program

CASREP: Casualty Report

CLF: Combat Logistics Force

CNAF: Commander Naval Air Forces

CNO: Chief of Naval Operations

COG: Cognizance Code

COMTUEX: Composite Training Unit Exercise

COSAL: Coordinate Shipboard Allowance List

COSBAL: Coordinate Shorebased Allowance List

CRAMSI: Consolidated Residual Asset Management Screening Information system

CRIB: Computer Resources Information Base

COSIP: Computer Open Systems Implementation Program

CVN: Carrier Vessel Nuclear

CVW: Carrier Air Wing

DBI: Demand Based Items

DBIR: Data-Based Item Retention

DCN: Design Change Notice

DLA: Defense Logistics Agency

DLIS: Defense Logistics Information Service

DLR: Depot Level Repairable

DoD: Department of Defense

DOP: Designated Overhaul Point

DRMO: Defense Reutilization and Marketing Office

DSP: Defense Standardization Program or Designated Support Point

EC: Engineering Changes

EMV: Extended Money Value or Extended Monetary Value

ER: Economic Retention

EMRM: Equipment Maintenance Related Material

FAST: Fleet Assistance and Shipboard Training Team

FIMARS: Force Inventory Management Analysis Reporting System: Afloat asset visibility/management

FISC: Fleet and Industrial Supply Center

FLR: Field Level Repairable

FMC: Fully Mission Capable

FMEA: Failure Mode and Effects Analysis

FMECA: Failure Mode Effects and Critically Analysis

FRP: Fleet Response Plan

FSC: Federal Stock Class

FST: Fleet Support Team

GAO: Government Accountability Office

HSC: Hardware System Command

ILO: Integrated Logistics Overhaul

IMA: Intermediate Maintenance Activity

IMRL: Individual Material Readiness List

ISC: Item Selection Conference

ISL: Intergraded Stock List

ISS: Interim Supply Support

LM: Logistics Manager

LMC: Local Management Code

MCC: Material Control Code

MILSTRIP: Military Standard Transaction Requisition

MIF: Master Item File

MIRL: Master Repairable Item List

MLDT: Mean Logistic Delay Time

MP: Maintenance Planning

MPD: Maintenance Planning Document

MRF: Maintenance Replacement Factor

MTBF: Mean Time Before Failures

MTIS: Material Turned Into Store

MTTR: Mean Time To Repair

MV1: Money Value One

MV2: Money Value Two

NADEP: Naval Aviation Depot

NALCOMIS: Naval Aviation Logistics Command Management Information System

NAS: Naval Air Station

NAVAIR: Naval Air Systems Command

NAVICP: Naval Inventory Control Point (NAVICP-P) Philadelphia (NAVICP-M) Mechanicsburg

NAVSEA: Naval Sea Systems Command

NAVSUP: Naval Supply Systems Command

NAVSUP CIS: Naval Supply Systems Command Corporate Information System

NWCF: Navy Working Capital Fund

NHA: Next Higher Assembly

NIIN: National Item Identification Number

NSN: National Stock Number

NSO: Numeric Stockage Objective

OBRPs: On-board Repair Parts

OH: On Hand

OMMS: Organization Maintenance Management System PM: Program Manager

OM&N: Operations and Maintenance Navy funds

OPN: Other Procurement Navy funds

OPTAR: Operating Target funds

OSI: Operating Space Item

PMA: Program Manager, Air

PMS: Planned Maintenance System - defines minimal scheduled maintenance and procedures

POSE: Practical Open Systems Engineering

PVIS: Part number Visibility - System for regional tracking of part numbers

RA: Repair Analysis

RAB: Redistributable Assets On-board

RAM: Residual Asset Management

RAO: Redistributable Assets on Order

RBS: Readiness-Based Sparing

REAVCAL: Reload AVCAL

RFI: Ready for Issue

RFU: Ready for Use

RLA: Repair Level Analysis

RPF: Rotatable Pool Factor

SAL: Ship's Authorized Levels

SALTS: Streamlined Alternative Logistics Transmission System

SALTS: Standard Automated Logistics Tool Set

SAS: Supportability Analysis Summaries

SCLSIS: Ship's Configuration

S&E: Support equipage (shipboard)

SE: Support Equipment (aviation)

SFM: Supply Financial Management

SIT: Stock Item Table

SMR: Source, Maintenance, and Recoverability

SNAP: Shipboard non-tactical automation program

SNSL: Stock Number Sequence List

SOM: Supply Operations Manual

SRA: Shop Replaceable Assembly

SSRA: Sub-Shop Replaceable Assembly

[S]UDAPS: [Shipboard] Uniform Automated Data Processing System

TAV: Total Asset Visibility

TD: Technical Directive

TEC: Type Equipment Code

TL: Transaction Ledger

TMS: Type-Model-Series

TSA: Technical Support Activity

TYCOM: Type Commander

UICP: Uniform Inventory Control Program

VMSIR: Virtual Master Stock Item Record

WRA: Weapons System Replaceable Assembly

WSM: Weapons System Manager

WUC: Work Unit Code

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I.   INTRODUCTION

A.   BACKGROUND

Naval Supply Publication 485 states the operating forces of the Navy are charged with supporting national policy under all conditions, ranging from peacetime through unlimited armed conflict. The Navy Supply System is designed to support the operating forces under any conditions existing at any given time. To meet these demands, ships are loaded with sufficient supplies to assure a prescribed period of self-sufficiency. The organic level of supplies loaded on-board consists of the allowance materials a ship is authorized to stock to sustain operations under specified maintenance concepts for a predetermined period. However, due to various allowancing changes, ships find themselves holding "excess material" that needs to be offloaded per TYCOM directives. Excess material in the context of this research paper is defined as material in excess of a particular unit's authorized allowance levels. Although portions of this excess material are considered to be obsolete/waste material, much of it still has future utility and needs to be redistributed for reutilization. The current processes regarding allowancing and offloads on-board aircraft carriers and at higher headquarters generate millions of dollars worth of Navy Working Capital Fund (NWCF) purchased-excess-materials that must be offloaded from ships annually; a large portion of which will flow through the Consumable Asset Reutilization Program (CARP).

As observed in Naval Supply Publication 485, "In the current era of rising costs and funding constraints, the identification and purging of excess stock has become an increasingly more important inventory control function." (Naval Supply Systems Command, 2005) Excess material processing is a major and costly effort for the U.S. Navy in both person-hours and realized dollar value. Aircraft carriers carry hundreds of millions of dollars in inventory and can generate excess material totaling tens of millions of dollars on an annualized basis. Though inventory practices and management metrics have been adjusted to minimize both the amount of excess material carried on-board and the amount generated by stock control operations, as of November 2010, more than $38 million in excess consumable material still existed on-board 10 carriers. CARP is an

inventory warehousing operation, separate from the Defense Logistics Agency that was created to among other tasks, manage and redistribute consumable excess Navy Working Capital Fund material from aircraft carriers.

B. PURPOSE

Naval Supply Systems Command has identified that a questionably large amount of material is allowanced to aircraft carriers and is subsequently offloaded as excess material. This material churn occurring on-board aircraft carriers as well as other organizations utilizing the NWCF has created the need for an entity designated as the CARP. CARP is responsible for receiving consumable Budget Project Code-28 (BP-28) excess material from these NWCF organizations. There is sometimes utility in offloading material from an aircraft carrier (e.g., when it is entering a maintenance phase), so that material can be made available to other ships that need it more (e.g., ships working up for deployment). An optimal allowancing process (including demand-based additions) would minimize the excess allowance generation (so that material was not loaded unless it was needed) and offload material only when the utility provided by making it available for other ships outweighed the cost of offload. Because of variability in demand, no allowancing procedure can do this perfectly. However, it is worth examining the data to see if there is any systematic pattern in offloads, to attempt to determine the root causes of those offloads.

Within the scope of NWCF consumable material held on-board aircraft carriers, the purpose of this report is to identify categories of root causes that drive the generation of excess material that is offloaded to CARP facilities. In doing this, our intent is to gain insights that will be useful in minimizing offloads.

C. RESEARCH QUESTION

What are the root causes of excess material offloads of NWCF consumable material from aircraft carriers?

For each root cause, what inefficiencies are driving the generation of excess material that is offloaded to the CARP facility?

D.   ORGANIZATION OF REPORT

The following chapter presents a literature review of the current Navy allowancing processes, the NWCF and the Budget Project codes used for consumable material, current offload processes and the CARP organization. These topics create the researchers foundation for research throughout the remaining chapters. Chapter III describes the scope of research and the methodology used to study the excess material flowing to CARP, further breaking the material/data into categories of drivers. Chapter III also discusses why and how the researchers developed their model for data analysis. Chapter IV provides the analysis of material flowing to the CARP facility and the resulting effects that will occur if adjustments are made to the current polices at the System Command (SYSCOM) and Type Commander (TYCOM) levels. Finally, based on the researchers' analysis, recommendations for policy changes and areas for future research are provided.

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II.   LITERATURE REVIEW

To fully understand how and why excess material flows from aircraft carriers to CARP, a fundamental understanding of the aircraft carrier allowancing process is required. Also, one should understand the responsibilities of cognizant commands and how these commands interact in the allowancing and excess screening process.
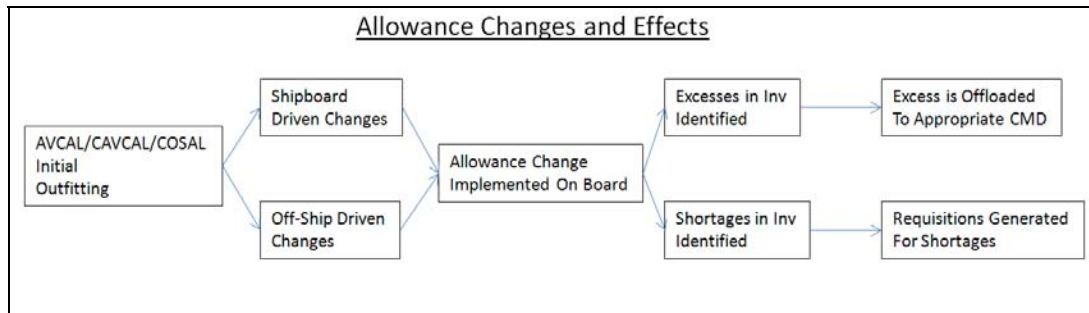
Figure 1. Strategic Conceptual Summary of Allowance Process and Effects

Initial outfitting of material that is to be held in stock by aircraft carriers is conducted by two commands. Naval Sea Systems Command (NAVSEA) controls the allowances for the parts support to the shipboard equipment. Naval Air Systems Command (NAVAIR) controls the allowances for the parts that support the Aircraft. Parts in inventory are funded differently. This literature review discusses how those differences are significant to the overall allowancing process. The Type Commander plays a significant role in the allowancing process. The Supply Department on-board the aircraft carrier can have significant impact on how much of each allowanced item is carried in inventory.

A.   INITIAL REPAIR PART OUTFITTING FOR SHIPS

An aircraft carrier material inventory supports a wide array of weapon systems that are on-board. Each of these weapons systems is considered in the process that develops the Coordinated Shipboard Allowance List (COSAL). The COSAL is a document that lists the following: the equipment and components installed on-board, the repair parts and the special tools required for the operation, overhaul, and repair of

equipment and components on-board, the Operating Space Items (OSI) and non-repair part consumables necessary for the safety, care, and upkeep of the ship itself, and aeronautical support equipment. (Naval Inventory Control Point, 2007)

Each Weapons System has an Allowance Parts List (APL). APLs are one of the two fundamental products of the provisioning process.

> APLs are prepared using information found in the weapons system file. APLs list both the technical characteristics of a particular piece of equipment and its logistic and supply information. APLs also identify all maintenance significant repair parts associated with the equipment. Each repair part listed is expected to fail during normal operation and is a potential allowance item. However, only those items with sufficiently high predicted failure rates or actual replacement rates, or those with technical overrides assigned (Planned Maintenance, Safety, etc) will normally be authorized as on-board Repair Parts (OBRPs). (Naval Inventory Control Point, 2007)

To identify a ship's authorized allowances, all the repair parts listed on installed equipment APLs that are within the maintenance capability of the ship are passed through a computation process. The four Chief of Naval Operations-approved mathematical models currently used in the COSAL/Coordinated Shorebase Allowance List (COSBAL) allowance development process. These are:

- Fleet Logistics Support Improvement Program.
- Modified-Fleet Logistics Support Improvement Program.
- Conventional
- Trident

Only the first three models listed above are applicable to the current research. At the heart of the first two methods is an equation that takes the usage rate, defined as the quantity of installed population of part multiplied by the Best Replacement Factor divided by 4, and compares it to a set insurance cut-off point to determine whether to carry the item. Variations of each model have dollar-value cut-off points, and each will make concessions to allow for stocking items based on factors such as Casualty Report (CASREP) history and planned maintenance. Predictions for expected failure rates are determined when historical data are not available at the initial outfitting of ships.

Once initial preparation of the APL has been completed, the Systems Command will outfit the ship with the initial load of repair parts. When the supply department comes on line and begins to make issues from inventory, the inventory levels become responsive to demand.

B.   INITIAL REPAIR PART OUTFITTING FOR AIRCRAFT

The Aviation Consolidated Allowance List (AVCAL) is created similarly to the COSAL regarding process creation of APLs for weapon systems installed on-board aircraft. COSAL and AVCAL are different in two ways. COSALs are developed to support one ship that has specific weapons systems installed on-board. AVCALs are specifically tailored to the mix of aircraft that are to be embarked on-board the aircraft carrier.

The first step in the AVCAL process is the development and promulgation of deployment schedules and the associated configuration planning. Once the ship is notified of an upcoming deployment, an Outfitting Directive is signed by the TYCOM controlling the aircraft carrier. Key information relating to the planned material requirements and configuration of the aircraft that will be embarked on-board for deployment will be contained in the Outfitting Directive. At the foundation of the Outfitting Directive is the Aircraft Equipment Configuration List (AECL), which must be verified for completeness and accuracy prior to TYCOM publishing the Outfitting Directive. The AECL must also be issued by the TYCOM to the ship as well as to NAVICP. (Naval Inventory Control Point, 2008)

The AVCAL process has incorporated the concept of Readiness-Based Sparing (RBS) since 1985, when it was mandated by the CNO as the preferred aviation sparing methodology.

> RBS is designed to achieve CNO-designated Full Mission Capable (FMC) readiness goals by type-model-series (TMS) aircraft at an individual air station, carrier, or L-Class ship. It does so by calculating the least-cost mix of repairable items necessary to achieve the TMS aircraft readiness goal. It was first implemented aboard a carrier in 1993 and it was fund that

readiness levels were maintained despite significantly reducing the spare parts requirement. RBS does not set wholesale inventory levels. (Chief of Naval Operations, 1999)

Of note regarding initial outfitting for AVCAL, Support Equipment (SE) load for the aircraft carrier must also be reviewed to ensure the deck load for Aircraft Intermediate Maintenance Department (AIMD) equipment is sufficient to support the aircraft that will be on-board. This can have an effect on the COSAL of the ship if changes to equipment on-board the ship are required. Changes in the ship's range or depth in number of the AIMD "benches," or workstation equipment, after the final AVCAL and associated documents have been certified, will be reviewed by TYCOM for concurrence, and then delivered to NAVICP for implementation of those changes to include changes to allowance listings. (Naval Inventory Control Point, 2008)

C.   ICP/TYCOM CONTROL OVER SHIPBOARD ALLOWANCES: COSAL

Once initial outfitting of an aircraft carrier has taken place, a great amount of effort must be made to ensure that the material on-board is relevant to and appropriate for the installed equipment. Inventory allowances become responsive to inputs from on-board the ship and off the ship. This section outlines how inputs into the ships allowances come from NAVICP and TYCOM to better reflect an inventory mix that is appropriate for the ship's COSAL.
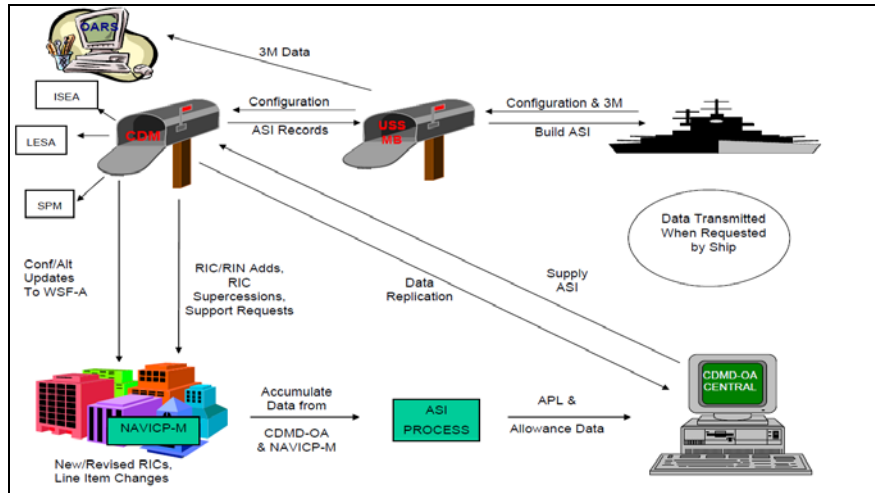
Figure 2. ASI Production Flow Chart (From? Naval Inventory Control Point, 2007)

Figure 2 displays a strategic view of the stakeholders involved in maintaining an up-to-date record of the ship's current configuration. The Navy is constantly procuring new systems, equipment, and components to be installed on-board aircraft carriers as well as on other ships. These must be supported by items such as repair parts, special tools, test equipment, and support equipment. (Naval Inventory Control Point, 2007) The record of configuration outlines every system that is installed on-board and details every part installed in those systems. COSAL is the portion of this configuration that details what parts are to be carried on-board to allow for at-sea repair.

Ultimately, authority to adjust allowances from that of which are pushed to the ship through the allowancing system rests with the Configuration Data Manager who is assigned by NAVSEA. Significant changes to the ships configuration typically occur during maintenance availability periods where the ship will receive new and/or updated equipment. Also, equipment is removed during these periods. The CDM is also closely involved during these periods. All equipment brought on and taken off must be accounted for because the supply support for those systems must be requisitioned for ships stock or removed from stock, respectively. The new equipment will have the associated

on-board spares requisitioned for the ship and will be placed into inventory by the ship's crew. The equipment that is removed will have the associated repair parts put in a queue for removal.

The SNAP/COSAL loses its value if it does not list repair parts, spares, and equipage needed to maintain all of the equipment on a ship. SCLSIS is the Navy's system for processing HM&E, Ordnance, & Electronics equipment configuration changes including the upkeep of the CDMDOA and WSF. When combined with ASI or CIA, it becomes a closed-loop system, which also provides updated allowance, logistics, and technical data to ships. (Naval Inventory Control Point, 2007)

D.   ICP CONTROL OVER SHIPBOARD ALLOWANCES: AVCAL

As with the COSAL allowancing for shipboard material, the AVCAL allowancing is challenging and poses an enormous task to maintain prudent line items relevant to the current embarked aircraft Type Model Series (TMS) deployed on-board. Unlike COSAL for HM&E material support, AVCAL supports ever-changing aircraft squadrons and platforms embarked during each deployment cycle.   Naval Inventory Control Point Philadelphia (NAVICP-P) is charged with the lead on this requirement, but works closely via the AQRCs to incorporate views of the TYCOM and the Air Wing that will embark to optimize allowances for upcoming deployment cycle.

The aircraft fleet is constantly adapting and undergoing updates and additions of entirely new systems. These dynamic changes result in the need for NAVICP to stay fully engaged in order to ensure proper allowancing and inventory accuracy within the carrier fleet. This section will discuss the AVCAL and CAVCAL allowancing process.

Currently, ICP uses a Multi-Indentured Readiness Based Sparing (MI-RBS) model to set allowances in the carrier fleet.   This system takes into account the aircraft flying hours, Mean Time Between Failures (MTBF) of systems involved, CVN fleet demand data for a 24_month period, and AV-3M data from NALCOMIS which encompasses AIMD's RFI rates and BCM rates per WRAs and SRAs. This process results in the development of the AVCAL, plus any subsequent allowancing bi-products such as the consumable material (CAVCAL) needed for the AVCAL shipboard support

via AIMD and Organizational Level Maintenance. Essentially, the MI-RBS model works in conjunction with the Navy Enterprise Resource Planning (ERP) system to achieve the Operational Availability/FMC goals as specified by OPNAV for each TMS. The ERP system aids in a more accurate AVCAL allowancing process by maintaining current master data files, demand data, current lead-time, requirement updates, and status of orders on file. The ERP system will ultimately be implemented across the Navy, but currently only operates within NAVICP.

E.   FUNDING

As with all Department of Defense services, budget obligation authority is provided by Congress each fiscal year, covering the period from 01October through 30September of the following calendar year. Under the Department of the Navy, these funds are called Operations and Maintenance, Navy (O&M, N), and they are originally provided to the Navy Comptroller, who divides them between the Atlantic Fleet and the Pacific Fleet Commanders. The Fleet Commanders then divide the funds among the Type Commanders (TYCOM), who generally allocate quarterly or perhaps monthly Operating Target (OPTAR) grants to individual units. These grants are then utilized by the individual units to obtain the necessary supplies to sustain daily operations and fulfill mission accomplishment (Naval Supply Systems Command, 2005).

The two primary Operating Targets granted directly to aircraft carriers are Supplies and Equipage (S&E), or Operating Fund Category-20 (OFC-20), and Aviation Operations Maintenance (AOM), or Operating Fund Category-50 (OFC-50). The S&E category is used for procuring supplies and services for daily operations. It is broken into two sub-categories: Equipment Maintenance Related Material (EMRM) for Depot Level Repairable items and repair parts, and "Other" for all other categories (Commander Naval Air Forces, 2009). The AOM category is "provided to fund the procurement of material and services necessary to support the Aircraft Maintenance Department at aviation activities" (Naval Supply Systems Command, 2005).

In addition to the OPTAR funds a unit receives, those holding inventory capitalized into the Navy Working Capital Fund (NWCF) are also sub-allocated Budget

Project (BP) funds to manage. The NWCF is primarily used by the Department of the Navy as a major support element for its operating forces for activities such as supply management, depot maintenance, research and development, transportation and base support (Department of Defense Office of Inspector General, 2008). Each BP fund within the NWCF is correlated to specific material categories.

Within the scope of this paper, we are specifically referring to BP-28 material that deals with the "retail repair parts and supplies" category (Naval Supply Systems Command, 2005). The reason NWCF activities are provided these additional BP funds is to replenish their capitalized stock levels because the inventory they are holding does not actually belong to them. For instance, a non-NWCF activity such as a Destroyer owns its inventory, so, if it needs to make an issue from stock, it would do so and then only spend its OPTAR when stock replenishment was reordered sometime in the future. On the other hand, a NWCF activity, such as an aircraft carrier, does not own its inventory. It is acting more or less like a floating warehouse until an item is requested from an end-user. When an item is needed from inventory, the end-user places its requisition and the revolving NWCF is reimbursed from the end-user's OPTAR once the material is issued. The fund is reimbursed based on the sale price of the material and the BP-28 working capital is then made available to replenish the activity's inventory levels (Naval Supply Systems Command, 2005).

The NWCF is not used to requisition any Initial Outfitting requirements or depth increases to support installed equipment. These allowance requisitions are centrally funded by the Other Procurement Navy (OPN) Account for ships and the Naval Air Systems Command Aircraft Procurement Navy (APN) account for aircraft (Commander Naval Air Forces, 2009). Once the initial items are received on-board, the new inventory is capitalized into the NWCF account and any subsequent stock replenishment requisitions are then funded by the NWCF.

F.   AIRCRAFT CARRIER ALLOWANCING

Allowancing or stocking authority on-board an aircraft carrier begins with its authorized organic level of supply (Naval Supply Systems Command, 2005). This level

is the range and depth of stock material each specific ship is required to carry to sustain operations under prescribed equipment maintenance concepts over a given period. Aircraft carriers are currently required to have 75_days of endurance demand levels for repair parts and equipment-related consumables on-board (Naval Supply Systems Command, 2005).

An aircraft carrier's primary allowance levels are developed and provided by external activities in the form of an allowance list. The primary allowance lists used by aircraft carriers for fixed allowance items are the COSAL, AVCAL and the CAVCAL. In addition to the range and depth authorized by these allowance lists, Demand Based Items (DBI) will also be carried in quantities determined by frequency and demand data for an average endurance level. The Chief of Naval Operations Instruction 4441.12C is the governing policy regarding inventory range and depth and defines DBI as follows:

> Demand Based Items are those that have a relatively high issue rate. Normally, an item that experiences a demand frequency of two or more in a period of six months and continues to have at least one demand every six months afterwards. The Demand Based quantity is that portion of the requisitioning objective (order high-limit) that supplements the allowance and/or load list quantity. If the DBI item is not an allowance or load list item, the entire quantity of the requisitioning objective is considered DBI stock. DBI items are stocked based on forecasted usage.

Once a DBI item has been authorized for stocking, both its requisitioning objective (high-limit) and reordering point (low-limit) levels are set. These items will be stocked at the determined levels until the Type Commander authorizes the activity to run Level Settings on their inventory database and the item no longer qualifies as DBI. If this occurs, the item will be converted to a Non-DBI item (Naval Supply Systems Command, 2005).

Level Settings is a crucial aspect of the aircraft carrier allowance management process and therefore cannot be performed without approval from the Type Commander. In general, the Type Commander will provide assistance via their Fleet Assistance and Shipboard Training (FAST) Team. This team will assist the ship with running its Live Level Settings three times during each Fleet Response Plan (FRP) cycle: post-deployment, after the existing AVCAL is adjusted and re-loaded (REAVCAL) and after

the Composite Training Unit Exercise (COMTUEX) (Commander Naval Air Forces, 2009). Conducting level settings at these key milestones ensures the aircraft carrier is receiving the most up-to-date frequency and demand data and is optimally positioned for sustainment during their next deployment cycle.

G.   AVIATION ALLOWANCING ON-BOARD AIRCRAFT CARRIERS

As mentioned previously, COSAL is primarily designed to enable the ship to accomplish its self-sustainment mission, whereas AVCAL is specifically designed to stock material for assigned aviation units so they can meet their deployed Full Mission Capable (FMC) goals (Naval Inventory Control Point, 2008). The AVCAL development process involves joint participation of the Navy Inventory Control Point – Philadelphia (NAVICP-P), Commander Naval Air Forces (CNAF), the embarking squadrons and the aircraft carrier's Aviation Supply Division personnel (Commander Naval Air Forces, 2009).

AVCAL is developed around a specified deployment schedule and aircraft configuration plan. Once a ship is scheduled for deployment, the TYCOM issues an Outfitting Directive which identifies the planned material requirements and the aircraft configuration that will be embarked for deployment (Naval Inventory Control Point, 2008). For the deployment AVCAL to be effective, the critical tasks of accurately validating the Aircraft Equipment Configuration List (AECL), the Interim Supply Support (ISS) Catalog, and the Individual Material Readiness List (IMRL) must be accomplished during the REAVCAL process (Commander Naval Air Forces, 2009). Once this is completed, NAVICP-P develops the initial deployment AVCAL and it then becomes the ship's Aviation Supply Division's responsibility for validating the suggested allowance adds and deletes against past demand to ensure adequate support of the Carrier Air Wing (CVW) during the deployment. Any desired changes are discussed at the AVCAL Quality Review Conference (AQRC). Lastly, it is reviewed periodically during the predeployment "work-ups" (Commander Naval Air Forces, 2009) and again eight weeks into the deployment to assess if any range or depth adjustments are needed based on actual performance data (Naval Inventory Control Point, 2008).

To establish inventory-level requirements for the AVCAL, an aviation community-wide approach is used within two distinct processes. The first develops range and depth allowances for repair-related consumable items, and the second for repairable items. Under the repair-related consumable allowancing process, requirements are based on "failure rates derived from reported afloat aviation maintenance (AV-3M) demands and flying hours per maintenance cycles" and then balanced against the aircraft and support equipment configuration scheduled to embark the aircraft carrier during the upcoming deployment (Naval Inventory Control Point, 2008).

The repairable allowancing process utilizes the Readiness Based Sparing (RBS) methodology to establish optimum spares allowancing with the least-cost mix. The RBS process is used at the retail level of supply and was designed to meet the Chief of Naval Operations (CNO)-designated Full Mission Capable (FMC) readiness goals by type-model-series (TMS) for aircraft, and in 1985 "was mandated by the CNO as the preferred aviation sparing methodology for repairable spare parts" (Chief of Naval Operations, 1999). To do this, NAVICP-P will first review the previous eight quarters of community maintenance data from deployed ships to determine a Maintenance Replacement Factor (MRF) and a Rotatable Pool Factor (RPF), which is input into the RBS model (Naval Inventory Control Point, 2008). Any changes to the MRF or RPF will subsequently create changes to the recommended allowance quantities that will be addressed at the Allowance Quality Review Conference.

Although the allowancing processes discussed above have proved reliable over time and have allowed the vast majority of aircraft carriers to accomplish their mission objectives, no forecasting method is perfect, and therefore room for improvement exists. Our research focuses on aspects of the allowancing process that lend themselves to the creation of excess consumable inventory retained on-board and will subsequently need to be offloaded.

H.   EXCESS INVENTORY

In an ideal world, excess inventories would not exist. We would have a system that perfectly forecasted demand for the right material in the correct amount at precisely

the right time. However-, this is not the case and issues surrounding excess inventory are prevalent in various organizations and are something the Navy has been experiencing first-hand for many years. Excess inventory as examined in this research is defined as material currently in excess or above a predetermined allowance level authorized to be held on-board a naval activity.

Since 1990, the Government Accountability Office (GAO) has expressed the opinion that the Department of Defense's (DOD) inventory management process is a high-risk area (Government Accountability Office, 2008). A significant portion of that perceived risk lies in the area of excess inventory. In a general sense, excess inventory can be thought of as the amount of inventory held that is over and above the inventory required to meet an activity's operational requirements or, as Rosenfield (1989) states, "when the potential value of excess stock, less the expected storage costs, fail to meet salvage value." Specifically, the U. S. Navy defines excess inventory at the wholesale or depot levels as any quantity of material greater than 24 months of normal usage (General Accountability Office, 1992). A more detailed description of excess inventory at the retail or ship level will be addressed in following sections.

Under these definitions, it appears excess inventory has been a major issue among Navy depots for many decades. For example, as observed by GAO (1992): during "fiscal years 1987 to 1991, annual excess inventory balances ranged from $40.1 million to $53.6 million. These large balances remained even though $138 million of excess material had been eliminated from depot records through write-offs during these years" (General Accounting Office, 1992). Additionally, another study on Navy's excess inventory was conducted by the GAO for fiscal years 2004 to 2007 and their analysis showed "on average, about $11.3 billion (60%) of the average annual total inventory value of $18.7 billion was needed to meet current requirements and $7.5 billion (40%) exceeded current requirements" (General Accounting Office, 2008). Of this $7.5 billion, the report indicated that approximately half of it was specifically marked as being either potential excess (26%), contingency retention inventory (10%), or being held for economic retention because it was less costly than disposal (17%).

Based on these numbers, it is apparent that excess inventory concerns held by GAO are valid and need to be addressed within the Navy's wholesale inventory management system. However, the wholesale or depot levels are not the only area where this concern is valid; it must be addressed within the retail levels as well. This issue is becoming more critical as increasing national deficits and shrinking defense budgets have become the norm. Because of this, the effective use of ship OPTAR resources is becoming more and more crucial for mission accomplishment. To help alleviate some of this fiscal pressure and streamline the process, it is necessary to investigate methods of reducing the generation of excess inventory that will free up valuable resources to purchase more critical requirements. We now look at excess inventory as it pertains to the retail or ship level of supply as well as some of the common drivers that cause items to become categorized as excess inventory.

1. Excess Inventory at the Retail Level

Items determined to be excess inventory on-board aircraft carriers are called Redistributable Assets on-Board (RAB). As described in the Commander Naval Air Forces Instruction 4440.2A, RAB are items that have a level of stock on-hand that exceeds the sum of the Ship's Authorized Levels (SAL) and Authorized Retention (AR) levels. SAL is the maximum value of stock authorized on-board and the AR is the redistributable assets authorized for retention. AR is made up of two components, Demand-Based Item Retention (DBIR) and Economic Retention (ER). DBIR items are those with a quantity of redistributable assets on-board that is equal to a 12-month demand and are considered "eat down" rather than excess stock, and ER items are those redistributable assets with a total value less than or equal to $100.

The excess inventory computations are conducted internally within the inventory system and items determined to be RAB are provided a specific Allowance Type Code (ATC). Allowance Type Codes ranging from ATC-1 through ATC-9 are assigned to every stock record within the Stock Item Table (SIT) and indicate the stocking authority for each item on-board. In the case of excess inventory or RAB material, the primary codes of interest are ATC-6 and ATC-7. ATC-6 specifically references material which

is deemed to be excess and has an Extended Money Value (EMV) greater than $100. These items will eventually have to be offloaded from the aircraft carrier for redistribution or disposal. ATC-7 material is considered excess inventory, but does not have an EMV greater than $100 and is held on-board for Economic Retention (ER) (Commander Naval Air Forces, 2009). As stated in the Naval Supply Publication-485, the following additional excess inventory definitions are provided for the remaining Allowance Type Codes:

- ATC-1 Through 5 – Are allowance items, DBI, and temporary allowance material with quantities of material above the requisitioning objective plus the authorized retention quantity for Navy Stock Account material (charged to OPTAR) and all material over the requisitioning objective for the Appropriation Purchase Account (not charged to OPTAR) or DLR material.

- ATC-8 – Are not carried items and all material on hand is considered excess.

- ATC-9 – Are substitute material on hand in quantities above the required amount to meet deficiencies of the primary stock number.

As with any organization, excess inventory issues can have a direct financial impact because they cause the organization to incur additional costs or sacrifice scarce resources that could otherwise have been utilized more effectively elsewhere (Crandall & Crandall, 2003). In the current era of reduced funding, it is critical to effectively manage inventories to maximize mission objectives and accomplishment while minimizing the generation of excess inventories. As stock replenishment prices rise and funding constraints continue to tighten around the fleet, the accurate identification and purging of excess inventory has now become a more important inventory function than ever before (Naval Supply Systems Command, 2005). However, even more important than the identification and purging of this excess inventory is the need to identify what actually drives its creation so one can work to find and implement solutions to best reduce it at the source. The next section identifies and explains some of the common drivers of excess inventory. The best ways to reduce it are examined as we continue down the path of discovery throughout the remainder of the research project.

2.   Excess Inventory – Common Drivers

Many causes for excess inventory on-board Navy ships can range from intentional allowance or configuration changes inherent within a dynamic operation at sea to the unintentional changes due to improper inventory management or stock control practices. The reasons vary, but the end result is the same: underutilized resources within the Navy Supply System. These resources are either wasted in the form of dead-stock or need to be redistributed for higher use by another activity. The following categories are not all-inclusive, but represents some of the potential drivers/causes of excess inventory held on-board aircraft carriers.

a.   *Automated Shore Interface (ASI)/Allowance Loads*

Through the ASI process, the ship's database is updated to agree with the Navy's central configuration database. This database is comprised of two parts: the Ship's Configuration and Logistics Support Information System (SCLSIS) database and the Weapons System File (WSF) (Naval Inventory Control Point, 2007). This process ensures the currently installed equipment and weapons systems are accurately reflected for proper logistics support. When allowances are decreased or omitted because of the ASI process, the resulting material above the new allowance becomes excess. A similar outcome results from reduced or deleted allowance adjustments during an Allowance Load process such as AVCAL/CAVCAL.

b.   *Monthly Change Notices and Annual Price Changes*

These are periodic changes that update the ship's Stock Item Table to ensure the ship's information matches the Centralized Accounting and Billing (CAB) database (Commander Naval Air Forces, 2009). Unit of issue changes or condemned National Item Identification Numbers (NIIN) may arise from Monthly Change Notices which could result in excess inventory if not processed correctly. The Annual Price Changes become effective on October 1st and will contain the forecasted procurement costs for the coming year (Commander Naval Air Forces, 2009). If costs increase enough, it may cause ATC-7 material values to rise above the Extended Money Value of $100.00 and migrate to an ATC-6 material.

c. *Demand History Processing/Level Settings*

This allowance adjustment tool uses current demand history to establish new average monthly demands (AMD) and allowance levels. This tool should only be run with the Type Commander's approval and authorized parameters. Excess inventory may be generated from allowance decreases or if the new AMD is significantly higher than the old because of unaccounted spikes in one-time or seasonal demand. If these one-time occurrences are not accounted for, the additional material will be ordered and received on-board and will likely become excess inventory once future level settings are run.

d. *Inventory Adjustments*

When an unaccounted item is found during an inventory, it is said to be "Gained by Inventory" (GBI) and may result in excess inventory.

e. *Improper Management of Stock Due*

The incorrect management of stock requisitions that have become Redistributable Assets on Order (RAO) may result in excess inventory. RAO is material that has not yet shipped from the supplier and has become considered excess because of a change in the Stock Item Table (Commander Naval Air Forces, 2009). This could have occurred for various reasons such as a change notice, an inventory adjustment, an ASI/allowance change or material turned-in by the end-user. Outstanding requisitions that become RAO must be cancelled in a timely manner or excess inventory may result.

f. *Improper Off-line Requisition Practices*

If off-line requisitions are not properly accounted for, they may result in duplicate stock replenishment orders that can result in excess inventory.

g. *Improper Stock Reorder Criteria*

If substitute items for a primary NIIN are not included while processing a reorder, more material than is required to meet demand may be ordered. This material may end up as excess inventory held on-board.

h. *Improper Issue/Receipt Processing*

As the basic building blocks for an accurate inventory, if the issue and receipt functions are not performed correctly you are likely to end up with numerous gains by inventory as well as some RAO conditions which could result in the generation of excess inventory.

Although the drivers mentioned above are not all inclusive, one can see there are many variables that could potentially cause authorized stock to become reclassified as excess material. Because there are so many variables surrounding the generation of excess material, it is not practical to think it can be reduced in its entirety; therefore, the need for appropriate processing and subsequent offload is required.

I. PROCESSING OF EXCESS MATERIAL FOR OFFLOAD

The offload of excess material held on-board ships is necessary because it provides a means for returning ready-for-issue material to the Supply System which can be redistributed to other activities. This process begins with the ship running an automated mechanized offload program within their Relational Supply inventory database. This will identify excess items that are above the TYCOM retention levels (Commander Naval Air Forces, 2009). This program is primarily run when large volumes of material are to be offloaded and should be run on a monthly basis and after any major changes to allowance levels. Specifically, carriers need prior approval from Commander Naval Air Forces to offload their excess BP-28 material because it is still owned by the Navy Working Capital Fund (NWCF). This material has unique requirements because it involves advance NAVSUP screening as well as advanced liaison with various external entities such as the Defense Reutilization and Marketing Office (DRMO) and the Consumable Asset Reutilization Program (CARP) (Commander Naval Air Forces, 2009).

As stated in the NAVSUP P-485, under the mechanized offload process there are two primary options for processing excess material for offload:

1. Money Value One (MV1)

A monetary value must be specified and only those records with an excess value greater than specified will be included. The value may be $0 if all excess records are to be reviewed or included in the offload, but should be set to $100 to facilitate turn-in to Material Turned Into Store (MTIS). Material with an EMV of less than $100 should be turned into DRMO. This option allows selection of the fewest items with greatest impact on the total value of excess material on hand.

2. Money Value Two (MV2)

This value is applicable to AT Code 6 records only and further constrains the records selected. When a value is specified, it must be greater than MV1. AT Code 6 material with an extended money value greater than MV2 will be selected for offload. Records with an extended money value less than MV2 but greater than MV1 will be retained on-board as AT Code 6 material. When the extended money value of the AT Code 6 record on hand is less than MV1, the AT Code will be changed to AT Code 7 and the material retained on-board. MV2 will be set to the default value specified in the constants file (should be set to $100) if a money value is not specified by the requester.

The AT Code 7 items retained on-board for economic retention reasons will most likely be offloaded during an Integrated Logistics Overhaul (ILO) or a REAVCAL evolution or as workload or other circumstances permit (Naval Supply Systems Command, 2005).   With the general parameters for offload processing identified, let us now look at the "Smart Offload" procedure which aircraft carriers and other activities holding BP-28 consumable materials are required to follow.

J.   THE "SMART OFFLOAD" PROCESS

The "Smart Offload" procedure outlines the process for material screening and offloading of excess ready-for-issue (RFI) NWCF-BP28 consumable material to the CARP facility.   Anytime an offload of BP-28 material is required by an activity,

advanced contact with the CARP Program Manager must be initiated to facilitate offload coordination and advance screening of the activity's On-Hand (OH) excess material (Naval Supply Systems Command, 2009).

Once an offload candidate list is identified, either by the activity, TYCOM, or NAVSUP, the first screen is conducted to determine the items CARP will not accept. Since CARP deals with consumable items, they will not accept items assigned a Material Control Code (MCC) of H, E, X, G, or Q and/or items with a Cognizance Symbol (COG) of 0_, 1H, 1R, 2_, 3H, 4_, 5R, 6_, 7_ or 8_. These items are considered NAVICP wholesale items and will be coded with a Local management Code (LMC) of "DD" and offloaded to the nearest FISC/Defense Depot (Naval Supply Systems Command, 2009). CARP also refuses to accept items with an EMV of less than $50 and will recommend these items be sent to DRMO.

In conjunction with determining the items CARP will not accept, the NAVSUPINST 4440.157B states the offload candidate list will be forwarded to NAVSUP and processed through the following four additional inventory screens:

> *IMM (primarily DLA) Advance FTE Review*. NAVSUP will submit MILSTRAP DOCID FTEs to the appropriate IMM for offload candidates to determine if the IMM/DLA is in a buy position (TA status). If the IMM/DLA is in a buy position for an NSN, the item will be marked for offload and further transfer to the IMM/DLA. Credit will be received for these items.

> *Demand Screening*. For offload candidates not accepted by the IMM/DLA for full credit (status code TA), the updated offload candidate list is then screened against a comprehensive Navy Combat Logistics Force (CLF) demand file from NAVICP. This file contains two years of Navy demand data (frequency and total demand quantity). Because the CLF demand file is only updated on a periodic basis, the offload candidate list is also augmented by CARP issues/reutilization to capture additional demand since the last update to the CLF demand file.

> *Index Factor*. To evaluate the demand pattern for a given excess NSN potential sale/reutilization under CARP, an index factor is assigned for each NSN under consideration. This index factor is used to determine if the NSN candidate should be accepted into CARP or recommended for disposal to DRMO. A demand index algorithm is used to identify those items with zero demand and to assign a demand index to those with

demand. Material with an acceptability index of 0.5 or greater is accepted into CARP, limiting the amount of material that would be taken into CARP to no more than a four-year supply of an item. High dollar items just below the index threshold are examined on a case-by-case basis.

Demand Index Algorithm. This calculation takes total demand for the time period (two years) and divides this number by the amount of material that is going to be offloaded plus current OH quantity in CARP. The result identifies items with zero Navy demand or produces an index factor that reflects a notional stock turn estimate for each NSN. For example, if the two-year demand was 100 and the offload quantity was 25 and the CARP OH was 75, the index factor would be 1.0. An index factor of 1.0 indicates the expected "turn" would be 100 units in the next two-year period. This algorithm is designed to provide a means to gauge future demand.

Based on the results of the previously-mentioned screens, NAVSUP will prepare an Excel file with eight separate worksheets assigning LMCs. This Excel file will be processed by the activity and appropriate offload guidance will be followed to execute the offload in accordance with the LMCs. The eight LMC worksheets are as follows:

1. One titled "FTE -TA for NSNs Approved for Credit by DLA IMMs."
2. One titled "CP for Range Items to be sent to CARP."
3. One titled "CP for Depth Items to be sent to CARP."
4. One titled "Depth Retention" which is those items identified through the CARP screening that are recommended for retention by the activity because the cost is too low to offload and there is an existing requisitioning objective.
5. One titled "HZ for Disposition to Hazardous Material Center."
6. One titled "DR for Disposition to DRMO."
7. One titled "9L for Disposition of Medical Material not accepted by CARP."
8. One titled "DD for Disposition to Local FISC/DD."

Our research is primarily concerned with items that have been screened for offload and are assigned an LMC prompting the activity to send them to CARP.

K. CONSUMABLE ASSET REUTILIZATION PROGRAM (CARP)

To understand the true function of the Consumable Asset Reutilization Program, one must first have a firm grasp on the difference between consumable repair parts and repairable repair parts. The following definitions are taken from the COSAL Use and Maintenance Manual:

Consumable Repair Parts: The term "repair part" refers to any item, including modules and consumable type materials, which has an

equipment application and appears in an APL, Stock Number Sequence List (SNSL), Integrated Stock List (ISL), Naval Sea Systems Command drawings, or a manufacturer's handbook. Part III, Section A of the COSAL SNSL/ISL lists repair parts and equipment related consumables normally stocked by the supply department. Any item in Section A is considered, by definition, a repair part. (Naval Inventory Control Point, 2007)

The material examined in this report is primarily related to this category of repair part. CARP was initially set up to be a warehousing through-point for this specific type of material when it came on-line.

Repairable Repair Parts: The term "repairable" refers to a component or part designated by the cognizant inventory manager as an item that can be economically repaired when it becomes unserviceable. Repairable items are identified by Material Control Code (MCC) D, E, G, H, Q, or X. MCC D items may be disposed of locally when they become unserviceable and cannot be locally repaired (i.e., by an organizational or intermediate maintenance activity). MCC E, G, H, Q, and X items are "DLRs" (see NAVSUP PUB 485). When they become unserviceable, they must be transferred to a Designated Support Point (DSP)/Designated Overhaul Point (DOP) as indicated by the Master Repairable Item List (MRIL) if an activity is not directed to follow Advance Traceability And Control (ATAC) procedures (Naval Inventory Control Point, 2007)

When "repairable" material is identified as excess on-board aircraft carriers, as mentioned in the "SMART" Offload section of this chapter, it is queued for offload to FISC or Defense Depot. By doctrine, CARP will refuse to accept excess material that falls into the repairable category.

Consumable Material or Consumables: The term "consumables" refers to administrative and housekeeping items, common tools, paints, or other items not specifically defined as equipage or repair parts. (Naval Inventory Control Point, 2007)

Based on the nature of consumables, considering they are for administrative and housekeeping related tasks, the excesses are off-loaded to DRMO and are not addressed in this report because they do not transfer to CARP facilities.

It is important to address these differences in types of material to ensure that the reader understands specifically that CARP only deals with consumable repair parts. As

described in the section titled SMART Offload Process, an overview is presented on how all categories of material are processed for offload to the range of recipients.

CARP currently exists in a warehouse building V-88 located on Naval Station, Norfolk, Virginia. The annual estimated total man-hours for the entire staff in the base year of the 2009 contract is 69,078, this equates roughly to a staff of 35 individuals working 40 hours a week for 50 weeks a year. At an approximate contract cost of $2,000,000 per year, this equates to an annual cost of $57,143 per individual.

The following description of Requirements is from the Statement of Work section of the contract for CARP services, and provides a summary of how CARP operates:

> The contractor's Level of Effort shall support Naval Supply Systems Command (NAVSUP) in logistics support for CARP in the areas of stock control, material receipt, warehouse management, inventory management, material handling and accountability, material issue, material shipment and transportation, material turn–in for disposal, and project management. Work products and services developed under this effort will affect the operational readiness of all afloat units, RSupply Naval Air Station (NAS) activities and Marine Corps aviation units by issuing material to afloat/ashore units and Marine Corps activities, as well as providing supply support for offloading Navy Working Capital Fund (NWCF) material from afloat/ashore activities. Work products and services developed under this effort will also afford NAVSUP the ability to capture the sales from excess material, credits for material bought back by the Defense Logistics Agency (DLA), and cost avoidance for Budget Project (BP)-28 as a result of redistribution of excess inventory. (Fleet Industrial Supply Center, 2009)

This report analyzes the excess consumable repair part material that is offloaded from aircraft carriers, which is a subset of the requirement listed above as "providing supply support for offloading NWCF material from (afloat) activities." This "supply support" includes the material receipt function of excess consumable repair parts offloaded from aircraft carriers.

III. SCOPE AND METHODOLOGY

A. INTRODUCTION

This chapter outlines the scope of the problem the researchers addressed and methodology utilized in developing an understanding of what material is being offloaded from aircraft carriers to CARP facilities. This understanding of what is being offloaded, and the driver behind the offload, leads to a clearer picture of what can be done to reduce the flow of material from the source.

B. SCOPE

NAVSUP requested assistance in addressing the problem stated below:

The Navy's current afloat allowancing program generates millions of dollars worth of excess material being offloaded from ships annually into the CARP program through the "Smart Offload" program as well as "RRAM" in TYCOM warehouses.

The research team further communicated with NAVSUP to come to an agreement that the scope for this project should be to target material that is offloaded to the CARP facilities. In order to gain an understanding of what platforms offload material to CARP through the utilization of the SMART offload program, NAVSUP Fleet Logistics Operations code 04 (NAVSUP 04) provided the following data from FY2005 to FY2011 (Through December 2010).

HULL	# of Offload Documents	Total Value Offloaded
CVs	226,327	$ 288,694,205.54
FRC FISC	46,410	$ 84,463,472.35
LHs	71,390	$ 70,427,499.34
MALS	80,013	$ 77,513,485.17
NAS	48,910	$ 50,339,824.07
Other	66,118	$ 25,469,043.92
TOTALS	**539,168**	**$ 596,907,530.39**

Table 1.   CARP Count of Receipts and Extended Monetary Value by Platform

Table 1 clearly identifies aircraft carriers as the largest contributor of excess material to CARP over the period from FY05 to December 2010. Aircraft carriers have offloaded 48.4%, or $288,694,206 worth, of all material value that is received by CARP, and the value of that material is 3.4 times higher than the next largest contributor.

In light of this data, the researchers, with approval from NAVSUP, narrowed the scope of the project to identifying the drivers behind the generation of consumable excess material on-board aircraft carriers. This research will identify the drivers and provide recommendations to eliminate the flow of this excess material to CARP.

C. METHODOLOGY

With the scope of this project defined as above, the researchers began with identifying what material was flowing from all aircraft carriers to the CARP warehouse facilities to better understand the volume of material. The researchers requested all records of transactions and associated data from aircraft carriers to CARP over the range of the lesser of five years of data or all data available. The purpose of this request was to identify the range of information we could collect about what was being offloaded. This request, sent to NAVSUP 04, returned 111,072 offload records beginning in FY05. It is important to note here that, for the purposes of this research, a "record" refers to a single document number. Each document has an associated quantity of a single type of material having the same National Item Identification Number (NIIN). The following table is an example of a record received and what information that we received that was germane to our research.

UIC	DN NR	FSC CD	NIIN CD	COG CD	UP AM	TRNSCTN PSTNG QT	UI CD	DATABASE ENTRY DATE	FY	EMV
03363	R0336382480858	4720	010171265	9B	522.69	1	EA	11/5/2008	FY09	522.69
20993	R2099362150257	4820	010175217	9B	4,105.08	1	EA	9/13/2006	FY06	4,105.08
21247	V2124770541122	5930	010182339	9B	76.20	2	EA	5/2/2007	FY07	152.40
03367	V0336770910167	5330	010178636	9B	2.98	49	EA	6/13/2007	FY07	146.02

Table 2.   Example Record of Material Offloaded from CVN to CARP

The fields above provide the following data on each record:

- **UIC:** Unit Identification Code- the unique identifier of the aircraft carrier that offloaded the material to CARP.

- **DN_NR:** Document Number- the unique identifier code generated by the offloading aircraft carrier that references the specific offload occurrence. Imbedded in this alpha-numeric code is the coast from which the aircraft carrier was assigned (1st character), the UIC of the aircraft carrier (next 5 characters), the Julian Date that the item was processed for offload from the ship (next 4 characters), and a unique serial number for that Julian Date (final 4 characters). The unique serial number is a sequential number between 0001-9999 assigned to each transaction occurring on a specific Julian Date.

- **FSC_CD:** Federal Supply Code – a code that identifies sourcing information for the procurement of the associated NIIN.

- **NIIN_CD:** NIIN – a unique code assigned to every item in the federal supply system.

- **COG_CD:** Cognizance Code – Utilized for Navy management purposes to identify and designate the Inventory Control Point office or agency which exercises supply management authority.

- **UP_AM:** Unit Price – This is the price of the individual NIIN at the time the record is generated.

- **TRNSCTN_PSTNG_QT:** Transaction Posting Quantity – Quantity of Units of Issue that were included in the transaction.

- **UI_CD:** Unit of Issue – Examples: EA-Each, RO-Roll, PG-Package, etc.

- **DATABASE_ENTRY_DATE:** Date the record was processed by CARP as a receipt from the aircraft carrier.

- **FY:** Fiscal Year the record was processed as received by CARP facilities.

- **EMV:** Extended Monetary Value – The Unit Price multiplied by the Transaction Posting Quantity. The total value of all material transferred by the record.

1. Defining the Population of Records for Research

The identification of what material was flowing from aircraft carriers to CARP was the first step in the process of identifying the drivers behind the generation of excess material. The information provided by NAVSUP 04 did not identify the reason why each item had been queued for offload and therefore more information on these items would be required.

Through coordination with Commander, U.S. Naval Air Forces code N41 (CNAF N41), the research team identified that individual Transaction Ledgers (TL) from each

ship would have to be reviewed in order to backtrack the reasons why each item was offloaded. There are two types of TL that CNAF N41 can provide from each ship's R-Supply database: the TL automated report and the TL query. Each had advantages and disadvantages, and both had a limit to the amount of history recorded for each item. In an effort to identify the feasibility of this method of research, a random sample of 50 documents was drawn from the population of 111,072 records available and the transaction ledgers requested from CNAF N41.

This sample of TLs provided several key pieces of information that would impact the remainder of the research for this project. First, with the exception of decommissioned aircraft carriers, the transaction data readily accessible through R-Supply dated back to FY2007. This limited the pool of offload records that could be researched. It was determined that at least one year of data would be required in order to have enough historical information to diagnose the cause of the event that led the item to be offloaded to CARP. Therefore, the pool of documents that could be researched was reduced to items with offload documents generated on or after October 1, 2007 (the start of FY2008). Table 3 describes the source, quantity, and values of records with the population to be researched.

UIC	Name	Hull #	FY2008		FY2009		FY2010		Totals	
			QTY DOCS	Value	QTY DOCS	Value	QTY DOCS	Value	QTY DOCS	Value
03363	KITTY HAWK	CVN 63	10,305	10,403,738.29	2,078	2,685,214.42	1	651.84	12,384	13,089,604.55
03365	ENTERPRISE	CVN 65	2,305	2,275,595.13	7	46,165.18	577	2,818,739.64	2,889	5,140,499.95
03367	KENNEDY	CVN 67	56	115,411.10	-	-	104	656,437.98	160	771,849.08
03368	NIMITZ	CVN 68	-	-	-	-	961	1,156,471.22	961	1,156,471.22
03369	EISENHOWER	CVN 69	1,689	1,726,878.22	5	38,771.04	54	234,303.15	1,748	1,999,952.41
20993	VINSON	CVN 70	7,172	9,163,091.37	158	100,575.43	1,351	117,175.53	8,681	9,380,842.33
21247	ROOSEVELT	CVN 71	3,609	9,139,436.11	20	8,780.78	8,495	12,052,565.89	12,124	21,200,782.78
21297	LINCOLN	CVN 72	-	-	83	78,591.04	409	640,533.94	492	719,124.98
21412	WASHINGTON	CVN 73	9,764	18,078,313.85	-	-	-	-	9,764	18,078,313.85
21847	STENNIS	CVN 74	3,441	8,279,224.39	209	152,567.29	3,194	4,217,025.34	6,844	12,648,817.02
21853	TRUMAN	CVN 75	2	10,611.40	2,795	4,013,359.13	-	-	2,797	4,023,970.53
22178	REAGAN	CVN 76	1,853	3,370,952.78	20	10,541.29	421	288,196.91	2,294	3,669,690.98
Totals			40,196	$ 62,563,252.64	5,375	$ 7,134,565.60	15,567	$ 22,182,101.44	61,138	$91,879,919.68

Table 3.   Offload Summary for Items Having Enough TL History to Research

2.   Selection of the Sample Size for Investigation

With a population size of 61,138 records to select from, the research team worked with the readiness branches at Commander, Naval Air Forces in San Diego and Norfolk,

as well as Prof. Doerr and Prof. Kang to identify a sample size that would be large enough to draw statistically significant conclusions about the population while keeping the level of effort for all parties involved within reason. The sample size determined appropriate for this research was 500 records from the population of 61,138. The team was concerned with several factors in making the decision on sample size.

First, generating TLs on specific NIINs from specific aircraft carriers was a manual process. Commander, Naval Air Forces was dedicating personnel to this process, and each record required approximately 30 seconds of processing time inclusive of consolidation efforts per report.

Second, at this point the researchers did not have a comprehensive range of reasons for offloads that existed in the population. Categories such as changes to the CAVCAL and ASI processing were known. Other categories would present themselves as the review of the TLs was occurring. The sample size would have to be large enough to identify the range of categories and make conclusions about them.

Following an initial review of the sample, a coding scheme would be agreed upon which would be used to categorize the records into a fixed set of reasons-for-offload from CARP. One of these categories would be a catch-all (other), and the number of records assigned to this catch-all category would be used, following the review of the individual records, to assess the sufficiency of the coding scheme. (Too many records assigned to the catch-all would indicate the need for further refinement of the categories.)

Finally, each record would be individually reviewed by each of the three members of the research team. Researchers would independently assign a reason codes to the individual record. The level of agreement among the research team members would then be assessed (Fleiss' κ). Once a satisfactory level of agreement was reached, any disagreements would be resolved by the research team. Thus, every record sampled would be assigned a categorical reason for the offload to CARP.

3. Selection of the Sample (n=500)

Utilizing the =RAND( ) function in Excel, each of the 61,138 records in the population were assigned a random number between the value of 0 and 1. All records were then sorted by that random decimal value, and the first 500 records were selected to be researched. Two methods were used to ensure that the random sample was representative of the population. First, a comparison was done to make sure that the percentage of offload documents by ship was consistent between the sample and the population. Second, the EMVs associated to each record in the sample and the population was analyzed.

a. Analysis of Sample and Population Records by Ship

Table 4 illustrates how many and what percentage of records were offloaded by each aircraft carrier both in the population of record and in the sample of records selected from the population. In order to ensure the sample represents the population, the percentages should be close.

Population Proportions By Ship			Sample Proportions By Ship			
Name	Records	% of Population	Name	Total	% of Sample	Difference
KITTY HAWK	12,384	20.26%	KITTY HAWK	94	18.80%	1.46%
ROOSEVELT	12,124	19.83%	ROOSEVELT	96	19.20%	0.63%
WASHINGTON	9,764	15.97%	WASHINGTON	75	15.00%	0.97%
VINSON	8,681	14.20%	VINSON	81	16.20%	-2.00%
STENNIS	6,844	11.19%	STENNIS	57	11.40%	-0.21%
ENTERPRISE	2,889	4.73%	ENTERPRISE	20	4.00%	0.73%
TRUMAN	2,797	4.57%	TRUMAN	24	4.80%	-0.23%
REAGAN	2,294	3.75%	REAGAN	21	4.20%	-0.45%
EISENHOWER	1,748	2.86%	EISENHOWER	13	2.60%	0.26%
NIMITZ	961	1.57%	NIMITZ	12	2.40%	-0.83%
LINCOLN	492	0.80%	LINCOLN	5	1.00%	-0.20%
KENNEDY	160	0.26%	KENNEDY	2	0.40%	-0.14%
Grand Total	61,138		Grand Total	500		

Table 4.   Proportions of Offload Records by Ship in Population and Sample

This table displays that the largest difference between the sample and population is 2% in terms of which ships contributed what numbers of records. This piece of analysis concludes that the sample is representative of the population.

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b. *Analysis of Mean EMV of Sample and Population*

The researchers analyzed the mean of the record EMVs as an additional measurement of the sample being representative of the population. Utilizing the Standard Error and a 95% confidence interval, the researchers concluded that the sample is representative of the population. Table 5 provides the calculations and the associated values for this evaluation.

Description	Symbol/Calculation	Value
Sample Mean of EMV		$ 1,295.54
Sample Standard Deviation of EMV	s	$ 3,756.82
Sample Size	n	500
Standard Error	$SE_{\bar{x}} = \dfrac{s}{\sqrt{n}}$	$ 168.01
Upper Limit of 95% Confidence Interval	$\bar{x} + (SE \cdot 1.96)$	$ 1,624.84
Lower Limit of 95% Confidence Interval	$\bar{x} - (SE \cdot 1.96)$	$ 966.25
Population Mean of EMV		$ 1,502.83

Table 5.   95% Confidence Interval of the Sample Mean of EMV being Representative of Population Mean of EMV

The fact that the population mean of EMV of $1,502.83 is within the 95% confidence interval for the average EMV further supports our contention, that the sample is representative of the population.

4.   Identification of Reasons (Categories) for Items Offloaded to CARP

The researchers identified seven specific reasons for offload in addition to the "other" category. All categories are defined below:

a.   *CAVCAL Allowance Adjust*

CAVCAL allowance adjustments follow the processes described in Chapter 2 of this report. The CAVCAL allowances are set by NAVICP and are approved by TYCOM and the ship's Supply Officer. Once the CAVCAL allowance changes are approved, they are processed on-board the ship. Excess material is screened periodically by the SMART Offload program. Items identified as meeting the criteria for a CARP Offload are then assigned a Local Management Code and are offloaded at a later date.

An example of a CAVCAL allowance change resulting in an offload to CARP is displayed in Figure 3.

trans_phrase	niin	trans_data	trans_dt	lname
Annual Price Chg	003280566	72.94\ \	9/28/2007 18:30:05.386	NAGLE
Allow Adjust	003280566	\ \U\0\00\A\\ 0.00\0 \0 \\\\\\ \	5/20/2008 11:05:39.353	McGovern
Allow Adjust	003280566	A\D\1\5950\003280566\ \EA\0 \COIL,RADIO FREQUENC \9B\\ 72.94\ 0.00\\ \	5/20/2008 11:05:39.353	McGovern
Annual Price Chg	003280566	72.46\ \	9/30/2008 16:48:04.896	NAGLE
Annual Price Chg	003280566	74.16\ \	9/30/2009 17:35:58.473	Weems
LMC Add	003280566	CP\	11/30/2009 12:29:11.193	Weems
Stk Rcd Chg	003280566	5950\003280566\ \ \EA\O\ \ \\ \\ \\\\\\ \	11/30/2009 12:29:11.376	Weems
Offload	003280566	43735\PDD\EA\1 \0 \R\2184793361489\KZ\9B\ 74.16\0\	5/11/2010 08:50:19.22	Coccetti
Annual Price Chg	003280566	78.13\ \	9/29/2010 15:30:19.103	Sicat

Figure 3. Example of CAVCAL Allowance Change Resulting in Offload to CARP

The key entry that generates the need for offload on the above document is coded as "Allow Adjust" occurring on 5/20/2008. The "Allow Adjust" entry is a single entry, but the code in the trans_data column is enough to require two separate rows of data. The record appears to have been entered twice, but, in fact, it is only one entry. In the "Allow Adjust" entry, the bottom of the two lines contains the most information that applies to the record. The initial "A" represents the allowance list for AVCAL with the following "D" standing for the action code for "delete." This information is followed by the NSN and unit of issue. The entry following the unit of issue "EA" is the changed allowance value. In this instance, that value is changed to 0. The "LMC Add" row identifies when the item was queued for offload to CARP, and the "Offload" row contains the details about the offload, to include how many were offloaded and the price of each unit.

b.   ASI COSAL Allowance Adjust

ASI COSAL allowance adjustments are generated through the Configuration Data Manager. This process is detailed in Figure 2 in Chapter II, of this report. The allowance changes to the ships COSAL are processed in batches. When allowances are lowered or removed, the item is identified as excess and is queued for the SMART Offload process. Figure 4 represents an item that is rendered excess by the processing of an ASI.

Annual Price Chg	002252662	14.78\ \	10/2/2006 14:19:14:856	Douglas
Annual Price Chg	002252662	15.21\ \	10/1/2007 13:16:09:826	Xiong
Inventory Count	002252662	4 \0 \0 \0 \H\4 \ \	5/4/2008 12:51:41:086	Homans
Annual Price Chg	002252662	15.37\ \	10/1/2008 05:11:24:376	Homans
ASI Rcd Chg	002252662	0 \6\ \\\\\ \ \\\ \\\ \\\ \	9/14/2009 14:30:13:826	Adams
Annual Price Chg	002252662	15.10\ \	10/1/2009 08:53:33:253	Cullen
LMC Add	002252662	WW\	3/11/2010 11:11:57:596	Gregg
Stk Rcd Chg	002252662	5365\002252662\ \ \EA\O\ \ \\\\ \\\\\\ \	3/11/2010 11:11:57:753	Gregg
Offload	002252662	43735\PDD\EA\4 \0 \V\2124700750242\KZ\9B\ 15.10\0\	3/30/2010 07:41:02:183	Gregg
LMC Del	002252662	WW\	7/26/2010 11:05:45:57	Gregg
Inventory Count	002252662	0 \0 \0 \0 \H\0 \ \	9/15/2010 10:57:20:71	Thorne
Annual Price Chg	002252662	15.80\ \	10/1/2010 09:22:49:516	Cullen
Loc Del	002252662	1607F2 \S\ \ \ \ \	12/3/2010 12:25:47:31	Gregg
Stk Rcd Chg	002252662	5365\002252662\ \ \EA\O\ \ \\\\ \\\\\\ \	12/3/2010 12:25:47:523	Gregg

Figure 4. Example of ASI Record Change Resulting in Offload to CARP.

The record heading "ASI Rcd Chg" identifies the automated transaction implemented by the batch ASI processing for the individual record. It is followed by the NIIN of the item. In the center column of that record, the 0 represents the new allowance of the NIIN and the 6 represents the AT code of the item. AT Code 6 represents an item that is no longer allowanced and the material is considered excess. The "LMC Add" record that follows two rows later identifies the LMC that corresponds to the CARP offload. Two records further down is the details behind the offload of the item. This record contains the same information that is on the offload document.

c.   Decommissioned Ship Inventory Offloaded to CARP

The "DECOM" category refers to all items held on-board aircraft carriers following the date the ship was decommissioned.   The material held on-board is processed through the SMART Offload program and, qualifying items will be queued for transfer to CARP facilities. This category applies to all items offloaded from the aircraft carriers USS Kitty Hawk and USS John F. Kennedy . All items offloaded from these aircraft carriers are coded in the DECOM category.

d.   Demand Based Item (AT Code 4) Allowance Adjustment

Demand based items are those that meet parameters and thresholds set by the Level Settings process outlined in the NAVSUP P-485. Under the DBI concept, action points (High Limit/Requisitioning Objective and Low Limit/Reorder Point) are set based on frequency and demand. Frequency is defined as the number of times an item is requested. Demand is defined as the quantity of items requested with each frequency. To

be considered as DBI, the item needs to have experienced a frequency of demand two or more times within the past six months. When an item no longer meets the frequency of demand criteria over the TYCOM prescribed Retention Period, it will be redesignated as a NONDBI item and stocked only to its original authorized allowance level. Inventory held in excess of this original allowance level will be reclassified as excess material and subsequently offloaded. Figure 5 represents an example of a DBI item that is rendered excess by the Level Setting process.

Inventory Count	000076103 9 \0 \0 \0 \H\9 \ \	11/16/2007 18:30:33:066	West
Annual Price Chg	000076103 13.23\ \	10/1/2008 20:13:31:386	hill
Inventory Count	000076103 9 \0 \0 \0 \H\9 \ \	12/29/2008 09:04:10:646	niewinski
Stk Lvl Chg	000076103 6\0 \0 \\	2/19/2009 13:11:45:183	foronda
LMC Add	000076103 CP\	4/1/2009 09:04:48:653	akinsuyi
Stk Rcd Chg	000076103 5315\000076103\ \ \EA\0\ \ \ \\ \\ \\\\\\ \	4/1/2009 09:04:48:833	akinsuyi
Offload	000076103 43735\PDD\EA\9 \0 \V\2185390911411\KZ\9B\ 13.23\0\	6/16/2009 15:39:23:61	didier

Figure 5. Example of DBI Record Change Resulting in Offload to CARP

The record header "Stk Lvl Chg" in Figure 6 signifies the Level Setting process was run and allowance levels were recomputed. It is followed by the NIIN of the item In the center column of that record, the 6 represents the new AT code of the item that would have changed from an AT code 4 (DBI) and the following 0 represents the new authorized allowance level of the NIIN. Again, AT code 6 represents that portion of an item that is no longer allowanced and is therefore considered excess. The "LMC Add" record that follows identifies the LMC that corresponds to the CARP offload that is identified two rows later.

e. *Ship Generated Offload of Material Held On-Board*

Items categorized as Ship Generated offloads were identified on the Transaction Ledger by an inventory "Gain" and a subsequent CARP offload. Gains are typically found during routine storeroom spot inventories and are generally caused by mistakes in inventory management practices vice a specific allowance change. Figure 6 illustrates an example of this type of entry.

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trans_phrase	niin	trans_data	trans_dt	lname
Allow Adjust	000431947	\ \\\ \\\ 0.00\0 \0 \\\\\\	3/8/2007 08:46:54.283	Dejesus
Allow Adjust	000431947	Q\\5\5355\000431947\ \EA\2 \KNOB \9B\\ 2.32\ 0.00\\ \	3/8/2007 08:46:54.283	Dejesus
Gain	000431947	48 \EA\2099372060028\ \ \	7/25/2007 11:49:03.98	Gregg
Inventory Count	000431947	78 \0 \0 \0 \H\78 \ \	7/25/2007 11:49:04.583	Gregg
Annual Price Chg	000431947	2.46\ \	10/1/2007 11:29:38.996	Dejesus
LMC Add	000431947	CP\	10/11/2007 13:09:57.096	Gregg
Stk Rcd Chg	000431947	5355\000431947\ \ \EA\O\ \ \\ \\ \\\\\\ \	10/11/2007 13:09:57.26	Gregg
Offload	000431947	43735\PDD\EA\52 \26 \R\2099372841029\KZ\9B\ 2.46\0\	10/18/2007 10:17:07.096	Bass

Figure 6. Example of Ship Generated Offload to CARP

As Figure 6 indicates, a "Gain" of 48 individual units represented by the "EA" unit of issue was found on 7/25/2007. This "Gain" signifies a level of inventory above the current authorized allowance and is therefore considered excess and will eventually need to be offloaded. The ship has some flexibility in when this material is offloaded and it will depend on the ship's current level of excess material held on-board as well as the availability of near-term offload opportunities. As Figure 6 shows, the "LMC Add" row identifies when the items were queued for offload to CARP, and the "Offload" row contains the details regarding the offload, to include how many were offloaded (52), how many remained on-board (26) and the price of each unit ($2.46).

f.   Medical COSAL Adjustment (Resulting From Policy Change)

Items categorized as Medical offloads were identified by a NIIN nomenclature in the transaction data field and a subsequent CARP offload recorded on the TL. Medical material is used by the medical and dental departments only. This material does not support COSAL or CAVAL requirements in anyway. This procedure is terminated as medical material is no longer handled by the Supply Officer on-board after a policy change in 2008.   This policy change was validated by the researchers after conferring with the SME's at CNAF. These NIINs were pulled into the Medical category to eliminate result distortions within the other categories. Figure 7 illustrates a sample of this type of transaction.

trans_phrase	niin	trans_data	trans_dt	lname
Stk Rcd Chg	007836949	\007836949\ \ \ \0\ \ \ \ \ \ \ \ \ \ \ \ \ \ 132.69\ \	7/24/2008 09:40:50.053	NAGLE
Inventory Count	007836949	18 \0 \0 \0 \H\18 \ \	10/13/2008 21:35:04.476	Matlock
ASI Rcd Chg	007836949	0 \6\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	10/21/2008 10:44:13	Reese
Allow Adjust	007836949	\ \U\0\00\A\ \ 0.00\ \0 \ \ \ \ \AM\	12/11/2008 07:29:21.76	Weems
Allow Adjust	007836949	I\ \1\6515\007836949\ \PG\9 \SUTURE,ABSORB,SURGICAL \9B\A\ 132.69\ 0.00\ \ \	12/11/2008 07:29:21.76	Weems
Stk Rcd Chg	007836949	\007836949\ \ \ \0\ \ \ \ \ \ \ \ \ \ \ \ \ \ 128.21\ \	7/14/2009 10:18:34.556	Weems
Stk Rcd Chg	007836949	\MM\ \ \ \ \ \ \ \ \ \ \ \ \ \ \	10/13/2009 09:25:59.773	Urquhart
Stk Rcd Chg	007836949	6515\007836949\ \ \ \0\ \ \ \ \ \ \ \ \ \ \ \ \	10/13/2009 09:25:59.773	Urquhart
LMC Add	007836949	CP\	2/25/2010 06:50:44.573	Weems
Stk Rcd Chg	007836949	6515\007836949\ \ \PG\0\ \ \ \ \ \ \ \ \ \ \ \ \ \	2/25/2010 06:50:44.7	Weems
Stk Rcd Chg	007836949	0 \0 \0 \ \ \6\ \	3/4/2010 10:47:57.143	Weems
Stk Rcd Chg	007836949	0000\007836949\ \ \ \0\ \ \ \ \ \ \ \ \ \ \ \ \	3/4/2010 10:47:57.143	Weems
Stk Rcd Chg	007836949	\ \ \ \1\ \ \ \	3/20/2010 13:33:34.593	Weems
Stk Rcd Chg	007836949	6515\007836949\ \ \ \0\ \ \ \ \ \ \ \ \ \ \ \ \	3/20/2010 13:33:34.593	Weems
Offload	007836949	43735\PDD\PG\18 \0 \R\2184700630578\KZ\9B\ 128.21\0\	3/20/2010 16:14:03.32	Stamerra

Figure 7. Example of Medical NIIN Offload to CARP prior to Policy Change

g.   *NIIN Superseded and Subsequently Offloaded*

Items categorized as Superseded offloads were identified by the word "Supersedes" in the TL record heading field and a subsequent stock record change (Stk Rcd Chg) followed by a CARP offload recorded. Figure 8 provides an example of this type of transaction. Records are established in the file as a result of change notice actions received from NAVSISA or other ICPs. This material will no longer be applicable to systems on-board the ship or aircraft embarked. The researchers found very few Superseded NIINs, however they were categorized for accuracy.

trans_phrase	niin	trans_data	trans_dt	lname
Supercedes	006406823	009674208\	6/23/2007 11:39:43:396	stellpflug
Stk Rcd Chg	006406823	\006406823\ \9C\ \0\ \ \9B\ \ \ \ \ \ \ \ \ \ 42.36\ \	6/23/2007 11:40:40:506	stellpflug
Annual Price Chg	006406823	42.67\ \	9/30/2007 08:27:57:936	Morgan
Inventory Count	006406823	2 \0 \0 \0 \H\2 \ \	9/12/2008 12:44:18:976	Ordonez
Annual Price Chg	006406823	42.39\ \	9/30/2008 10:11:48:453	Powell
Inventory Count	006406823	2 \0 \0 \0 \H\2 \ \	8/22/2009 13:59:57:806	Arenasmorfin
Annual Price Chg	006406823	43.39\ \	10/1/2009 12:01:04:913	User
LMC Add	006406823	CP\	6/10/2010 07:34:06:273	Powell
Stk Rcd Chg	006406823	4730\006406823\ \ \EA\0\ \ \ \ \ \ \ \ \ \ \ \	6/10/2010 07:34:06:436	Powell
Offload	006406823	43735\PDD\EA\2 \0 \R\0336801610376\KZ\9B\ 43.39\0\	8/6/2010 19:27:25:003	Ordonez
Annual Price Chg	006406823	45.71\ \	9/30/2010 09:59:55:533	PADAMADA

Figure 8. Example of a NIIN Superseded and Offloaded to CARP

h.   *Other*

The "Other" category refers to those items found within the Transaction Ledger data, which did not have readily identifiable indicators clearly pointing to a specific cause for the offload. Because a clear driver could not be identified, the researchers developed this category to account for all recorded offloads flowing to the CARP facility.

5. Fleiss' Kappa Category Agreement Measures

The researchers independently categorized each of the 500 records into one of the eight possible categories. The researchers used the Fleiss' Kappa method of measuring the level of agreement to determine how well the researchers agreed on the categorization of each of the records.

The formula for Fleiss' Kappa statistic is (Fleiss, 1971):

$$\kappa = \frac{\bar{P} - \bar{P_e}}{1 - \bar{P_e}}$$

The numerator represents the degree of agreement actually achieved and the denominator represents the degree to which agreement is attainable above chance. A perfect agreement above chance is represented by a value of $K = 1$. In situations with little to no agreement, the value of K approaches and can go below 0.

Figure 9 displays the spreadsheet the researchers used in identifying the Kappa statistic for all records. The eight columns of data represent the following categories respectively: CAVCAL, ASI, DBI, Medical, DECOM, Superseded, Ship Generated Offload, and Other. The resulting kappa value for all records was 0.876, which represents a very high level of agreement among the researchers in categorization of the 500 documents.

		1	2	3	4	5	6	7	8	Total	P_i
						Fleiss Kappa Model on Offload Categories					
Offload Doc (N)	1	0	0	0	0	3	0	0	0	3	1.00
	2	0	0	0	0	3	0	0	0	3	1.00
	3	0	0	0	0	3	0	0	0	3	1.00
	4	0	0	0	0	3	0	0	0	3	1.00
	5	0	0	0	0	3	0	0	0	3	1.00
	500	2	0	1	0	0	0	0	0	3	0.33
	Total	563	363	130	13	288	3	91	49	1500	453.33
	p_j	0.375	0.242	0.087	0.009	0.192	0.002	0.061	0.033	1	

$\bar{P} =$	0.907
$\bar{P_e} =$	0.249
$k =$	0.876

Figure 9. Fleiss' Kappa Statistic Calculation with All Records Included

With the Kappa statistic being high enough to reflect a near perfect agreement, the researchers re-calculated the Kappa statistic excluding the records classified as DECOM. The records that were classified as DECOM had perfect agreement. Because the USS Kitty Hawk and the USS John F. Kennedy were decommissioned from operations, all records that came from those aircraft carriers were placed in the same DECOM category.

In light of the DECOM category potentially skewing the Kappa statistic, the researchers recomputed the Kappa statistic excluding the 96 records that were classified in the DECOM category. Figure 10 represents the calculations behind the revised Kappa statistic of 0.829, which still indicated a very high level of agreement among researchers with the DECOM category excluded from calculation.

Fleiss Kappa Model on Offload Categories										
Offload Docs (N)	1	2	3	4	5	6	7	8	Total	P_i
1	1	0	0	2	0	0	0	0	3.00	0.33
2	1	0	0	2	0	0	0	0	3.00	0.33
3	2	0	1	0	0	0	0	0	3.00	0.33
4	0	0	0	0	0	0	1	2	3.00	0.33
5	1	0	2	0	0	0	0	0	3.00	0.33
404	2	0	1	0	0	0	0	0	3.00	0.33
Total	563	363	130	13	0	3	91	49	1212.00	357.33
p_j	0.465	0.300	0.107	0.011	0.000	0.002	0.075	0.040	1	

$\bar{P} =$	0.884
$\bar{P}_e =$	0.324
$k =$	0.829

Figure 10.   Fleiss' Kappa Statistic Calculation with DECOM Records Excluded

6.   Reconciliation of Disagreements in Categorization

The researchers had disagreement on a total of 69 records out of the 500. All of the records were reviewed by the three researchers together to identify the reason for offload to CARP. Once this process was completed, and each record had been assigned a categorical reason for offload, the researchers were able to move on to the analysis phase of their research.

IV. ANALYSIS AND RECOMMENDATIONS

A. INTRODUCTION

This chapter presents analysis of the data using the methodology described in Chapter III. Again the research objectives of this project are restated for clarity.

1. Research Objective

The research analyzes consumable Navy Working Capital Fund excess material flowing from aircraft carriers to CARP. The researcher's primary objective was to study the current afloat allowancing processes to determine driver's for the generation of excess material flowing to CARP and to provide recommendations for potential changes to the processes that will reduce this flow. A secondary objective was to identify policy changes that would not only reduce the flow of excess material, but attempt to balance the impact of retained inventory being held on-board. The recommendations could include changes to the allowancing systems or the offload program.

B. DATA ANALYSIS

1. Driver's of Excess Material Flowing to CARP

Table 6 depicts the eight categories researchers identified in Chapter III as drivers of excess material flowing to CARP from aircraft carriers over the 2.8-year research period, which fell between FY2008–FY2010.

Driver	Count	% Sample Including DECOM	Count	% Sample Without DECOM
CAVCAL	191	38.20%	191	47.28%
ASI	122	24.40%	122	30.20%
DBI	38	7.60%	38	9.41%
Ship Generated	28	5.60%	28	6.93%
Other	18	3.60%	18	4.46%
MEDICAL	6	1.20%	6	1.49%
SUPERSEDED	1	0.20%	1	0.25%
DECOM	96	19.20%		
Sample Size	500	100.00%	404	100.00%

Table 6.   Categories of Excess Material by Count and Percentages

The table identifies the frequency distribution by count as well as a percentage for all eight categories based on the sample size of 500 randomly chosen records. As demonstrated in Chapter III, our sample data is representative of the entire population. Table 6 also shows what the frequency distribution of driver's looks like if we were to remove the category DECOM from consideration. This omission changes the sample size to 404 records vice 500; however, by omitting the DECOM category, a more accurate representation of the routine driver's of excess material are displayed. Although, DECOM material accounted for 19.2% of the excess material flowing to CARP throughout the research period, it is generally an infrequent onetime event and thus skews the magnitude of the other day-to-day drivers. Furthermore, by excluding DECOM, the table indicates, CAVCAL, ASI, and DBI as the top three drivers of excess material and accounted for 86.89% of the sample size. With these three primary driver's accounting for such a large majority of excess material flowing to CARP, the researchers focused their process analysis in these areas.

2.   Process Analysis of CAVCAL, ASI and DBI

Upon identifying and validating CAVCAL, ASI, and DBI as the three primary day-to-day drivers of consumable excess material flowing to CARP, the researchers began analyzing the current allowancing and offload processes associated with these drivers. The objective was to identify policy changes within the allowancing and/or offload processes that would reduce the generation of excess material and subsequent offload to CARP. However, during their allowancing process analysis, the researchers verified that all allowanced repair related consumable items were directly linked to associated repairable items and/or equipment. Therefore, any major adjustments to their allowance levels would need to be tied to independent analysis performed on the algorithms and optimization models used to determine the repairable and/or equipment allowance levels the consumable items supported. A research and analysis project of this type would need to include but is not limited to areas such as: Readiness Based Sparing (RBS) models, platform configuration processes, component Mean Time Between Failures (MTBF); maintainability (i.e., Mean Time To Repair (MTTR)); supportability as measured by Mean Logistic Delay Time (MLDT); and operating time (e.g., flight hours

or operating hours), as well as fleet-wide demand data and overall maintenance philosophy (Naval Inventory Control Point, 2008).

The researchers determined it would require individual projects for each of the three main drivers in order to conduct the necessary research and perform the in-depth analysis required to provide sufficient recommendations for fleet-wide allowancing process changes. Therefore, the researchers remained focused on the original scope of their exploratory project; identifying the drivers and making recommendations to reduce the flow of material offloaded to CARP.

Two main directions of focus were decided upon. First, the SMART Offload program currently has a policy to not offload items to CARP that have an EMV of less than $50 per record (Though in the sample this policy is violated 3% of the time). The researchers would explore the effect of raising this threshold above the $50 mark. Second, the researchers identified that the CAVCAL allowancing process was cyclical and tied to the deployment cycle of the aircraft carrier. The cyclical nature of the allowancing process generates and eliminates allowances of items far more often than any other allowancing process, and this is proven by the prominence of CAVCAL related offloads identified in Table 6. Many of the CAVCAL items offloaded have small unit price (UP) dollar values. If a policy were implemented to not reduce or eliminate allowances for small UP items on the CAVCAL that have a potential future use (i.e., the type of aircraft the item supported might return to the aircraft carrier in the future), an amount of CAVCAL material with small UP would remain on-board aircraft carriers and the offload would be avoided. The researchers would investigate the effects of implementing this policy at different UP thresholds. Figure 11 describes where in the CAVCAL allowancing process this new policy would be placed for effective implementation.

NAVICP-P to Implement the CAVCAL Process Adjustment

AVCAL Process Begins → CAVCAL Allowances Created → Screen items below UP $ Threshold for Allowance Reductions → Verify Material Applies to Active WS

Yes → Remove Allowance Reduction → Implement CAVCAL Allowance

No → Proceed w/ Allowance Reduction → Implement CAVCAL Allowance

➢ **Key Concept: Don't reduce allowances on low value CAVCAL items with potential future need.**

Figure 11.   Flow Chart of Proposed Change to CAVCAL Allowance Process

3.   Development of a Model as a Tool for Analysis

To support the analysis of the impacts of the two different thresholds, an Excel spreadsheet-based model was developed. Using the source data in the Appendix, the model was designed to select records that were below two different threshold levels, UP and EMV. Several assumptions were required in the building of this model.

The first assumption required is that DECOM ship categorized material is not applicable to this analysis. Material of this classification occurs very infrequently and no policy recommendation will stop this material from becoming excess material. The model recognizes the value of the DECOM categorized material and the quantity of records associated, but does not factor that material into any calculations.

The second assumption the model incorporates is that the UP threshold only applies to CAVCAL categorized records. The UP threshold is directly tied to CAVCAL items and no other because of the proposed policy being addressed by this threshold. The policy would be to stop the reduction of allowances for items that are tied to active aircraft platforms. The concept is that if there may be a need in the future for the low dollar value items, and instead of offloading these low dollar value items to CARP, keep them on-board in case they are needed in the future as that airframe returns to the aircraft

carrier. Because this possibility of a "returning need" is unique to the CAVCAL, no other category should be addressed when setting a UP threshold.

The third assumption in the model is that an EMV threshold would apply to all categories of records offloaded to CARP with the exception of DECOM as mentioned above. This threshold is modeling the impact of adjusting the SMART Offload criteria that currently does not route any excess material to CARP if the record EMV is less than $50.

Finally, and most importantly, the model assumes that the sample is directly representative of the population. Because the researchers sampled 500 records from a population of 61,138 records, it can be extrapolated that one record of the sample represents 122.3 records (equal to factor of 61,138/500) across the fleet of aircraft carriers.

The model user interface page is shown in Figure 12. The yellow highlighted cells represent the parameters that the user is able to manipulate. If the user desires to conduct an analysis of UP or EMV threshold alone, the user must ensure the opposite threshold is set to a value of 0. The model is capable of running an analysis of both thresholds simultaneously.

Adjustment to CAVCAL UP Threshold		Adjustment to SMART Offload EMV Threshold	
Threshold Value $ 225		Threshold Value $ 125	
Only CAVCAL is Included		DECOM Material is Not Included	

Current Values & Quantities Offloaded To Carp (No Change to Operations DECOM Not Included)						DECOM Records Excluded	Extrapolated
	Records	Piece Ct	$ Value	Cube Ft.	Weight (lbs.)	Records	96 / 11,738
Sample Data	404	7,647	$ 480,909	122	2,653	Piece Ct	1,608 / 196,620
Extrapolated to All CVNs	49,400	935,045	$ 58,803,618	14,966	324,399	$ Value	$ 167,138 / $ 20,437,017
Divided Across 10 CVNs	4,940	93,504	$ 5,880,362	1,497	32,440	Cube Ft.	245 / 29,986
						Weight	1,809 / 221,138

Scenario Results to Avoid Items Arriving at CARP						Transaction Cost Avoidance	% of $ Inv
	Records	Piece Ct	$ Value	Cube Ft.	Weight (lbs.)		
Sample Data	172	3,179	$ 33,436	42.9	392.6	DLA ($30)	$ 630,944 / 15.43%
Extrapolated to All CVNs	21,031	388,715	$ 4,088,408	5,243.8	48,007.3	CARP ($9)	$ 189,283 / 4.63%
Divided Across 10 CVNs	2,103	38,872	$ 408,841	524.4	4,800.7	CARP ($18)	$ 378,566 / 9.26%
Percent Change from Original	42.57%	41.57%	6.95%	35.04%	14.80%		

Figure 12.   Screen Capture of User Interface Page of Excel Based Model

The values in gray represent the total of all of the records that are being analyzed by the model. There is a section highlighted in red that indicates the number and value of the records classified in the DECOM ship category for offload that are not being analyzed by this model. The values represented in green are the dynamic calculations of values for records that fall beneath either the CAVCAL UP or EMV thresholds. All values are extrapolated to aircraft carriers fleet-wide values by a factor of 61,138/500 because of the assumption that the sample is representative of the population. The line just below the green represents the values associated with the records that fall below the thresholds as a percentage of the total of records flowing to CARP from aircraft carriers.

Once the model was developed, it was possible to run large-scale computations to chart outcomes for the two thresholds independently and simultaneously. The two outputs most important to the researchers were the total EMV of records no longer arriving at CARP facilities and the quantity of records no longer flowing to CARP. The threshold ranges decided upon by the researchers were [$0 − $1,000] for both. It is unreasonable to expect that for either policy, the threshold would be above the $1,000 level because of the net impact of increasing carrier inventories (for UP threshold) and eliminating the opportunity to redistribute high EMV records (for EMV threshold). These two outputs were graphed on a primary and secondary y-axes in the following figures. Figure 13 represents the outcomes for implementation a CAVCAL UP threshold and Figure 14 represents the outcomes for adjustments to an EMV threshold.
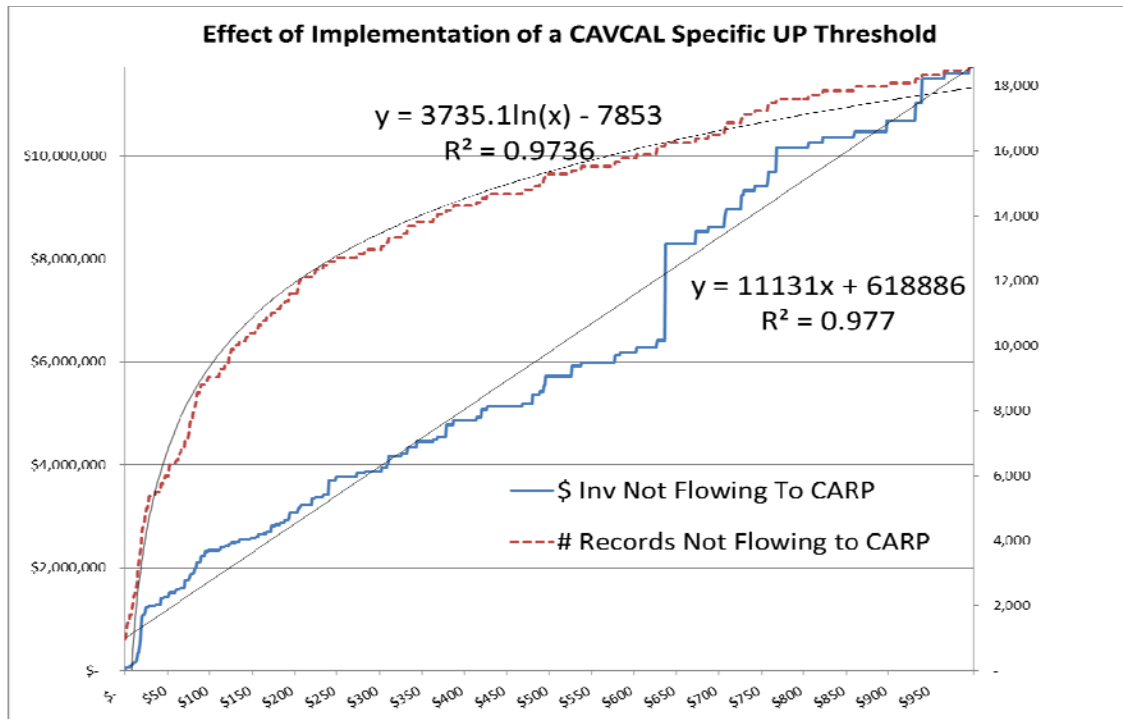
Figure 13.   Model Results of Manipulating the CAVCAL UP Threshold Input
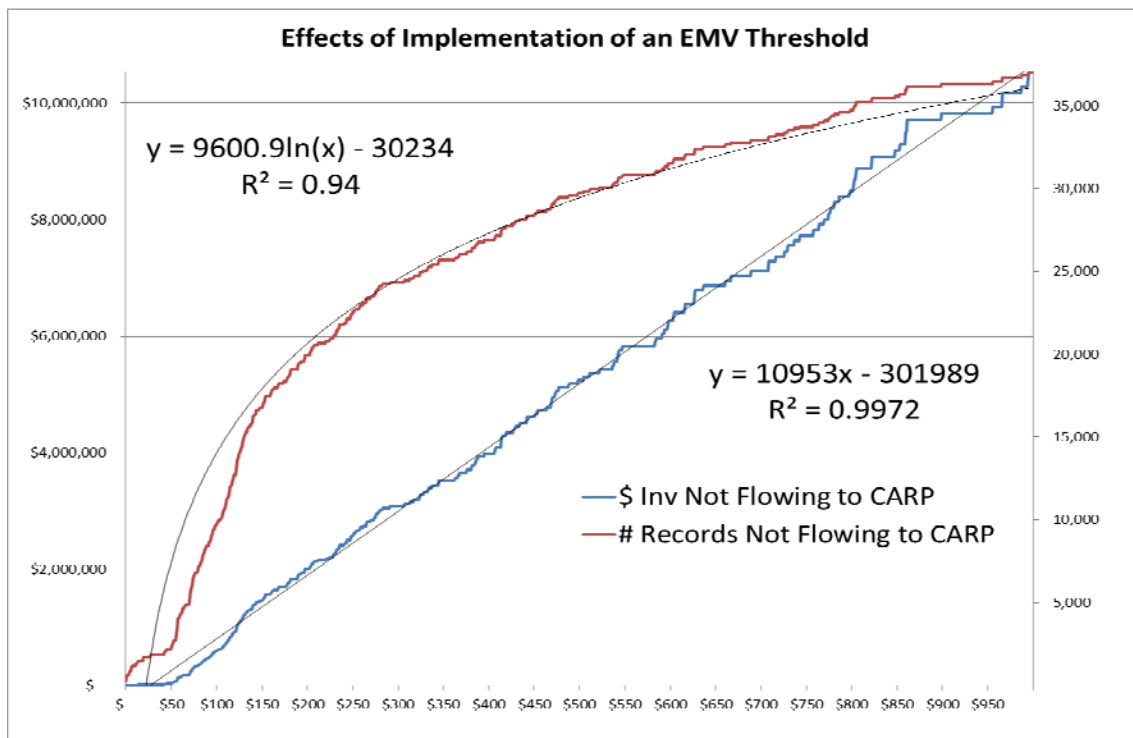
Figure 14.   Model Results of Manipulating the EMV Threshold Input

These graphs reveal two primary findings about the data pertaining to the thresholds. First, as both the UP and EMV thresholds increase, the dollar value of records that no longer flow to CARP increases at a steady, or linear, rate. In both scenarios, the R^2 of the linear trend line is above 0.975 indicating near perfect correlation. Second, as both UP and EMV thresholds increase, the quantity of records that no longer flow to CARP increases at a decreasing rate. This fits a logarithmic relationship between the threshold and quantity of records not flowing to CARP. Both R^2 values tied to the line of best fit are above 0.94 indicating a strong correlation. This logarithmic relationship is expected because across the population of items carried in aircraft carrier inventories, there are fewer and fewer high dollar items that remain as the cutoff that is being analyzed increases.

The researchers also conducted an analysis of the impacts of the implementation of a combined approach. For modeling purposes, the researchers computed 1,001 [0-1,000] variations of UP threshold and paired that range of inputs with the 1,001 [0-1,000] variations of EMV threshold for 1,002,001 variations on the model. This was an effort to identify any break points within the data. This effort provided value in the research process, but did not yield significant results. Combined analysis, discussed in a following section, was conducted to incorporate both the CAVCAL UP threshold analysis and EMV threshold analysis.

4.   CAVCAL Unit Price Policy Adjustment Analysis and Recommendation

The researchers first focused their analysis on CAVCAL, the largest driver of excess material flowing to CARP. To reduce sample error, the researchers utilized the model's two lines of best fit to produce the range of outputs identified in Table 7. The researchers had consensus that analysis on thresholds would be most effective in increments of $25. The increment was large enough to produce noticeable changes in dollar value and record quantity totals, while being small enough to produce a range of thresholds. As Table 7 indicates, the dollar thresholds range from $25–$1,000; however, the researchers did not display outputs between the ranges of $300 to $925 because of the lack of significant changes in the trend based analysis.

Unit Price $ Threshold	$ Value of Material Retained on Board (RoB)	Fleet-wide Transactions Avoided	Cumulative % of Fleet-wide Transactions Avoided	Marginal % of Fleet-wide Transactions Avoided	Avg $Value / Record	Imputed Holding Cost if Offloaded to DLA @ $30 Per Transaction	Imputed Holding Cost if Offloaded to CARP @ $18 Per Transaction	Imputed Holding Cost if Offloaded to CARP @ $9 Per Transaction
$25	$897,161	4,170	8.44%	8.44%	$ 215.16	4.98%	2.99%	1.49%
$50	$1,175,436	6,759	13.68%	5.24%	$ 173.91	6.16%	3.70%	1.85%
$75	$1,453,711	8,273	16.75%	3.07%	$ 175.71	6.10%	3.66%	1.83%
$100	$1,731,986	9,348	18.92%	2.18%	$ 185.28	5.78%	3.47%	1.73%
$125	$2,010,261	10,181	20.61%	1.69%	$ 197.45	5.43%	3.26%	1.63%
$150	$2,288,536	10,862	21.99%	1.38%	$ 210.69	5.09%	3.05%	1.53%
$175	$2,566,811	11,438	23.15%	1.17%	$ 224.41	4.77%	2.86%	1.43%
$200	$2,845,086	11,937	24.16%	1.01%	$ 238.35	4.50%	2.70%	1.35%
$225	$3,123,361	12,377	25.05%	0.89%	$ 252.36	4.25%	2.55%	1.27%
$250	$3,401,636	12,770	25.85%	0.80%	$ 266.37	4.02%	2.41%	1.21%
$275	$3,679,911	13,126	26.57%	0.72%	$ 280.35	3.82%	2.29%	1.15%
$300	$3,958,186	13,451	27.23%	0.66%	$ 294.26	3.64%	2.18%	1.09%
$925	$10,915,061	17,657	35.74%	0.21%	$ 618.17	1.73%	1.04%	0.52%
$950	$11,193,336	17,757	35.94%	0.20%	$ 630.38	1.70%	1.02%	0.51%
$975	$11,471,611	17,854	36.14%	0.20%	$ 642.54	1.67%	1.00%	0.50%
$1,000	$11,749,886	17,948	36.33%	0.19%	$ 654.66	1.64%	0.98%	0.49%

Table 7.   Model Outputs for CAVCAL Unit Price Policy Adjustments

Under the assumption that a policy is implemented—one that will stop the offload of inexpensive CAVCAL items on-board aircraft carriers that have potential future demand—the thresholds described by Table 7, derived from the modeled line of best fit for number of records and value, represent the net effect of the threshold at that level on the aircraft carrier fleet as a whole. At a $25 threshold, $897,161 of inventory will remain on-board as allowanced CAVCAL items, which will reduce 4,170 over a 2.8-year period. When the associated offload costs to CARP and DLA are annualized at their respective levels, and divided by the total dollar value of inventory retained on-board, the researchers were able to develop an imputed holding cost of inventory retained.

The transaction cost estimates used to calculate imputed holding cost percentages represented in Table 7 were provided by NAVSUP personnel. The DLA transaction cost of $30 accounts for both the receipt and issue of material whereas the CARP transaction costs revolve around individual transactions. An individual transaction consists of either a receipt or an issue of material. As of FY2010, CARP individual transaction costs were estimated to be $9. Although the researcher's primary concern was to reduce the receipt of material received by CARP, it was necessary to show transaction costs that would also

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consider the likelihood of subsequent issuing of that same material. Therefore, the researchers analyzed both $9 and $18 CARP transaction costs and determined that $18 provides a more accurate comparison to DLA. The imputed holding costs were calculated by multiplying the "Fleet-wide Transactions Avoided" by the appropriate transaction cost ($30, $18, $9) divided by the 2.8-year research period. This figure was then divided by the "$ Value of Material no Longer Offloaded to CARP" to arrive at the annualized imputed holding cost of inventory retained. Imputed holding costs are discussed further in the SMART Offload program policy change analysis section. More important to the analysis, the researchers computed the average dollar value per record under this policy.

It is understood that, by the nature of the diminishing marginal returns of the number of records falling below the threshold, that the analysis becomes a problem of "where to draw the line." Since this CAVCAL UP threshold would be a new policy to the fleet, the average unit price per record was a primary focus of this analysis as a key figure in where to draw the line. Table 7 shows that at the $25 threshold, the average dollar value per record, is $215. This average value sharply drops to $174 at a $50 threshold, and begins to climb. This effect is created because of a policy that CARP does not accept offloads where the EMV of the record is less than $50. Therefore, CAVCAL offloads where the UP of the item is $25 will have multiple like items tied to the same record, therefore driving the average value per record higher initially. This effect is accurately reflected in the lines of best fit and the sample data. The threshold value where the average value per record comes closest to returning to the original $215 is at a threshold value of $150, having an average value per record of $211. Based on this, the researchers recommend that the CAVCAL UP threshold be set at $150.

The goal of a policy of this nature would be to eliminate as much churn of low-dollar CAVCAL items as possible, while keeping high-dollar value items flowing off the carrier to an inventory pool for reutilization. Therefore, a balance must be struck between the number of offloads avoided and the value of that associated material. The researchers acknowledged that if the $25 threshold is acceptable, the $150 is far more beneficial because it maintains a similar average value per record while resulting in a much larger reduction in the number of offloads.

The researchers also acknowledge that if focus was primarily on minimizing the average value per record, a $50 threshold would be optimal, based on the $25 increments, however, this metric gives no consideration to the quantity of offloads reduced that are associated with the threshold. Because the researchers maintained that reducing the number of offloads is a priority, a recommendation of $150 was decided upon, as opposed to the $50 threshold. A threshold of $150 reduces the total number of offloads by an additional 8.31% when compared to $50.

Table 8 displays the estimated dollar values associated with the transaction costs avoided when setting the CAVCAL UP threshold at $150. These values were calculated by multiplying the "fleet-wide transactions avoided" column in Table 7 by the corresponding transaction cost represented in the far left column of Table 8. To obtain the annual transaction cost avoided located in the far right column of Table 8; the researchers divided the previous figure by the research period of 2.8 years. The results of this analysis are significant, as they identify the potential for direct fleet-wide savings by implementing a CAVCAL UP threshold policy.

Transaction Cost Avoidance Over the Research Period of 2.8 Years		Annual Transaction Cost Avoidance	
DLA ($30)	$ 325,860	$	116,379
CARP ($9)	$ 97,758	$	34,914
CARP ($18)	$ 195,516	$	69,827

Table 8.   CAVCAL UP $150 Threshold Transaction Cost Avoidance

5.   Adjustment of EMV Threshold in the SMART Offload Program

The researchers next focused analysis on impacts of an EMV threshold. To reduce sample error, the researchers utilized the model's two lines of best fit to produce the range of outputs identified in Table 9. The SMART offload program currently incorporates a threshold that denies any record with an EMV of less than $50 from offload to the CARP facility (though researchers identified 18 of the 404 sample records were below that threshold). The EMV threshold will analyze the impacts of raising the threshold above that $50 level. Once again, the researchers had consensus that analysis

on thresholds would be most effective in increments of $25. Table 9 displays the net effect of adjustments to the threshold from $50 to $1,000, however the researchers did not display outputs between the ranges of $150 to $925 because of the lack of significant changes in the trend based analysis.

EMV $ Threshold	$ Value of Material No Longer Offloaded to CARP	Fleet-wide Transactions Avoided	Cumulative % of Fleet-wide Transactions Avoided	Marginal % of Fleet-wide Transactions Avoided	Imputed Holding Cost if Offloaded to DLA @ $30 Per Transaction	Imputed Holding Cost if Offloaded to CARP @ $18 Per Transaction	Imputed Holding Cost if Offloaded to CARP @ $9 Per Transaction
$ 50	$ 245,661	7,325	14.83%		31.95%	19.17%	9.58%
$ 75	$ 519,486	11,218	22.71%	7.88%	23.14%	13.88%	6.94%
$ 100	$ 793,311	13,980	28.30%	5.59%	18.88%	11.33%	5.66%
$ 125	$ 1,067,136	16,122	32.64%	4.34%	16.19%	9.71%	4.86%
$ 150	$ 1,340,961	17,873	36.18%	3.54%	14.28%	8.57%	4.28%
$ 925	$ 9,829,536	35,338	71.54%	0.53%	3.85%	2.31%	1.16%
$ 950	$ 10,103,361	35,594	72.05%	0.52%	3.77%	2.26%	1.13%
$ 975	$ 10,377,186	35,844	72.56%	0.50%	3.70%	2.22%	1.11%
$ 1,000	$ 10,651,011	36,087	73.05%	0.49%	3.63%	2.18%	1.09%

Table 9.   Model Outputs for EMV Thresholds Adjustments, Excluding DECOM

It is understood that, by the nature of the diminishing marginal returns of the number of records falling below the threshold, that the analysis becomes a problem of "where to draw the line." Since there is an existing $50 EMV policy, the researchers were able to utilize the existing solution to the problem of "where to draw the line," for a possible rationale to support changing the threshold. The researchers computed imputed holding cost percentages for the existing baseline threshold across three separate transaction cost levels.

As mentioned in the previous CAVCAL Unit Price Policy Adjustment Analysis and Recommendations section, the transaction cost estimates used to calculate imputed holding cost percentages represented in Table 9 were provided by NAVSUP personnel. The DLA transaction cost of $30 accounts for both the receipt and issue of material whereas the CARP transaction costs revolve around individual transactions. An individual transaction consists of either a receipt or an issue of material. As of FY2010, CARP individual transaction costs were estimated to be $9. Although the researcher's

primary concern was to reduce the receipt of material received by CARP, it was necessary to show transaction costs that would also consider the likelihood of subsequent issuing of that same material, and provide a fair comparison to the DLA transaction cost figure. Therefore, the researchers analyzed both $9 and $18 CARP transaction costs believing that $18 provides a more accurate comparison to DLA.

The imputed holding costs were calculated based on the tradeoff between the transaction cost incurred if material is offloaded, and the inventory cost incurred if material is retained. At optimality, the tradeoff can be stated as:

$$iV = tR$$

where i is the imputed holding cost, V is the value of inventory retained, t is the transaction cost and R is the number of records. At equality, the marginal cost avoided by retaining the items on a record matches the incremental expense of retaining those items. We solve this equation for i, and apply it to our data by multiplying the "Fleet-wide Transactions Avoided" by the appropriate transaction cost ($30, $18, $9) divided by the 2.8-year research period. This represents an estimate of the cost that can be avoided by retaining the items. This figure was then divided by the "$ Value of Material no Longer Offloaded to CARP" to arrive at the annualized imputed holding cost of inventory retained.

Under the existing $50 threshold, and assuming $18 is an accurate CARP transaction cost, Table 9 indicates the annualized imputed holding cost of inventory no longer offloaded to CARP to be 19.17%. Based on the modeled outcomes and the assumption that the CARP function will transition to DLA at an associated transaction cost of $30, the closest corresponding imputed holding cost under the DLA $30 transaction cost column is 18.88% at an EMV threshold value of $100. Based on this, the researchers recommend that the EMV threshold be set at $100. Shifting the EMV threshold policy to $100 would reduce the number of excess material records offloaded from aircraft carriers to CARP (or DLA) by approximately 28.30%. Extrapolated to all CVN's, a reduction of this magnitude would result in approximately 13,980 fewer

records flowing from aircraft carriers to CARP over the 2.8-year period. The value of inventory no longer offloaded to CARP is estimated to be $793,311.

Table 10 displays the estimated dollar values associated with the transaction costs avoided when setting the EMV threshold at $100. These values were calculated by multiplying the "fleet-wide transactions avoided" column in Table 9 by the corresponding transaction cost represented in the far left column of Table 10. To obtain the annual transaction cost avoided located in the far right column of Table 10; the researchers divided the previous figure by the research period of 2.8 years. The results of this analysis are significant, as they identify the potential for direct fleet-wide savings by implementing this policy.

Transaction Cost Avoidance Over the Research Period of 2.8 Years		Annual Transaction Cost Avoidance
DLA ($30)	$ 419,400	$ 149,786
CARP ($9)	$ 125,820	$ 44,936
CARP ($18)	$ 251,640	$ 89,871

Table 10.   SMART Offload EMV Threshold Transaction Cost Avoidance

C.   RESULTS OF COMBINING THE TWO POLICY RECOMMENDATIONS

As explained in the previous sections, these policies independently reduce the quantity of offloads to CARP by 22% and 28% respectively, while withholding a minimal value of material from the benefits of reutilization that CARP provides to the fleet. The UP threshold deals with the allowancing side of the problem and addresses the largest driver of offloads to CARP, while the EMV threshold will focus on the transaction costs associated with offloads to CARP on records that have a larger average value. It is because they operate on separate sides of the excess generation equation that a combined approach creates significant overall reductions in excess material flowing to the CARP facility. Implementing an allowancing policy at NAVICP that will stop the lowering of allowances for CAVCAL items with a UP value of less than $150 will cause an estimated reduction of 22% of offloads from aircraft carriers to CARP, while an estimated 96% of the original value of the material will still be offloaded to CARP.

Implementing a policy in the SMART offload program that changes the threshold for record EMV from $50 to $100 will reduce the number of records flowing to CARP from aircraft carriers by an estimated 28%, while an estimated 98.65% of the original value of material will still be offloaded to CARP.

If the two policies are combined, a reduction in approximately **38.96%** of the offload records is realized, while approximately **95.04%** of the value of inventory is still offloaded for reutilization. Implementing these policies simultaneously can significantly reduce the quantity of very low dollar value items from flowing to CARP from aircraft carriers, while ensuring the more valuable stocked items are available for reutilization to the fleet. Several additional steps were taken in the estimation of these values.

1. Modeling the Overlap Between the Two Thresholds

To arrive at an estimate of how much the reductions and associated values would be, the researchers had to model the overlap functions that are derived from the sample overlap. This was accomplished by summing the values of the two policies set at the same threshold value over the range from $0 to $1,000, and then subtracting out the number of records and associated dollar value of material that met both criteria based on the model. A function had to be created as opposed to the actual model output in order to remove sampling error. Figure 15 depicts the modeled overlap at the range of thresholds of $0 to $1,000.
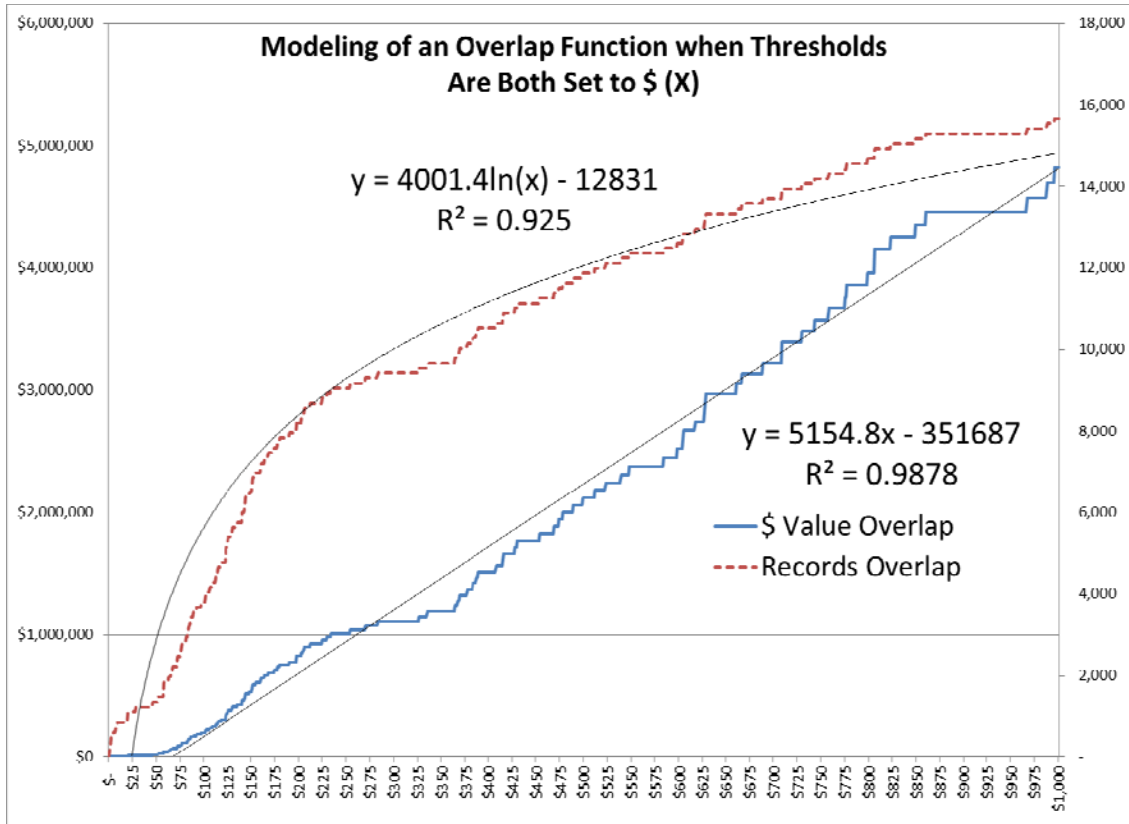
Figure 15. Overlap of CAVCAL and EMV Threshold Record Count and Value

2. An Example of How Overlap Was Determined

In the sample, if you independently set the CAVCAL UP and EMV thresholds at $200, the model would return values that indicate that 11,616 and 19,931 records, and $3,068,933 and $2,000,466 in value would be reduced from offload to CARP respectively. At the $200 threshold level, the sample model indicates that 23,355 records would be reduced from offload to CARP, indicating 8,192 records were beneath both thresholds (11,616 + 19,931 – 23,355). Similarly, at the combined $200 threshold level, the sample model indicates that $4,245,867 of material would not flow to CARP indicating $823,532 of material value was below both thresholds ($3,068,933 + $2,000,466 – $4,245,867). This same process was repeated for the range of $0 to $1,000 in combined threshold value. A key point in understanding the two thresholds is that the overlap function can be modeled only in terms of the lower of the two thresholds if the two thresholds are not the same.

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Based on the lines of best fit applicable to the individual policies, and the lines of best fit applicable to the overlap of the two, the researchers were able to derive an estimated reduction in records and associated value of material flowing to CARP. Table 11 displays these values.

	Type	Threshold	Reduction in Records Arriving at CARP		Reduction in Values Arriving at CARP	
			Line of Best Fit	Records	Line of Best Fit	Value of Inventory
	CAVCAL	$ 150	y = 3735.1ln(x) - 7853	10,862	y = 11131x + 618886	$ 2,288,536
add	EMV	$ 100	y = 9600.9ln(x) - 30234	13,980	y = 10953x - 301989	$ 793,311
subtract	Overlap	$ 100	y = 4001.4ln(x) - 12831	(5,596)	y = 5154.8x - 351687	$ (163,793)
				19,246		$ 2,918,054

Table 11.   Summary of Combined Policy Effects on Records and Value of Inventory

Over the 2.8 years of data that the researchers analyzed, the percentages of overall inventory are displayed above. If these policies were implemented 2.8 years ago, the estimated savings are displayed in Table 12 along with the estimated annualized transaction cost savings by the combined policy implementation. These values were calculated by multiplying the "fleet-wide transactions avoided" column in Table 11 by the corresponding transaction cost represented in the far left column of Table 12. To obtain the annual transaction cost avoided located in the far right column of Table 12; the researchers divided the previous figure by the research period of 2.8 years

Transaction Cost Avoidance Over the Research Period of 2.8 Years		Annual Transaction Cost Avoidance
DLA ($30)	$ 577,380	$ 206,207
CARP ($9)	$ 173,214	$ 61,862
CARP ($18)	$ 346,428	$ 123,724

Table 12.   Annualized Transaction Cost Avoidance with Combined Policy

While each of the policy recommendations presented in this chapter individually have significant impacts on reducing the quantity of excess material offloaded to CARP facilities, and allow most of the value processed through CARP to continue to be reutilized by CARP, a combined policy implementation addresses both the allowancing and offload processes involved in the generation and offload of excess material. The UP

policy will leave CAVCAL items worth less than $150 on-board the aircraft carrier, and these items may potentially have a future demand as associated airframes return to the aircraft carrier deployment compliment. The EMV threshold will allow for the line items that have an EMV less than $100, but no longer have allowances associated with them, to be offloaded to agencies other than CARP. Again, the UP threshold deals with the allowancing side of the problem and addresses the largest driver of offloads to CARP, while the EMV threshold will focus on the transaction costs associated with offloads to CARP on records that have a larger average value. It is because they operate on separate sides of the excess generation equation that a combined approach creates significant overall reductions in excess material flowing to the CARP facility.

V. LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

A. INTRODUCTION

As with any research project, not every stone could be turned, and the ones that were examined revealed even more opportunities for research. Through weeks of discussions with the NAVSUP sponsors, the researchers were able to narrow the scope of this project to a manageable level. In narrowing this scope to address offloads from aircraft carriers to CARP, the recommended policies presented in Chapter IV will reduce quantity of these offloads flowing to CARP by almost 40% while maintaining 95% of the value of the total material flowing to CARP available for reutilization. Material offloaded from decommissioning aircraft carriers was omitted because of the unique cause of the offload. This narrowing provided for the opportunity to analyze and recommend potential policy changes, however, the researchers recognize that plenty of opportunities exist for additional research on a broader scale.

1. Fleet-wide Impacts of a CAVCAL UP Threshold of $150

The recommendation provided by the researchers did a representative analysis on what the impacts would be on records offloaded to CARP if a UP threshold was implemented by NAVICP. What this analysis could not address is the overall impact of the policy on the fleet. For instance, some CAVCAL material did not meet the parameters of the SMART offload program, and was therefore offloaded as excess to DRMO. This analysis did not capture the impact of that material in terms of cost and size. We recommend that NAVICP analyze, from the allowancing perspective, what the net impacts on the aircraft carrier are of not lowering the allowances for CAVCAL items worth less than $150 still tied to operational aircraft. Also, this policy could potentially apply to other CAVCAL end-user elements such as Naval Air Station inventories.

2. Fleet-Wide Impacts of SMART Offload Program Adjustment of CARP Acceptance Threshold to an EMV of $100

The analysis conducted on the EMV threshold was limited to what was being offloaded from aircraft carriers over the last 2.8 years. This policy, if implemented unilaterally, would affect offloads from other commands that offload excess material to CARP if it meets the threshold. An analysis should be conducted to address what quantity and value of material would no longer be offloaded to CARP for reutilization. The research should focus on what percentage of transactions are avoided, and what the transaction cost savings would be based as compared to the current threshold used by the SMART offload program.

3. Frequency of Computing Level Settings Onboard Aircraft Carriers

The researchers observed that demand based items were responsible for 9.41% of material offloaded to CARP as excess (excluding material from decommissioned ships). This qualifies as the third largest driver, when material from decommissioned ship is excluded. Analysis was not conducted on this category of data; however, it indicates there is potential for process improvements regarding the policies governing the computing of level settings on-board aircraft carriers. The stakeholders on this research are Commander, U.S. Naval Air Forces and Naval Supply Systems Command.

APPENDIX

Category	Category Description
1	CAVCAL Adjustment
2	ASI Allowance Adjustment
3	DBI Allowance Adjustment
4	MEDICAL COSAL Adjustment
5	DECOM Ship
6	Superseded Item
7	Ship Generated Offload
8	Other

Table 13.   Listing of Researcher Assigned Category Codes for Offload Records

Hull #	Name	Coa	UIC	Julian Date	Serial #	NIIN CD	UP AM	QTY	YR Posted	MO Post	EMV	Weight	Cube	Category
CVN 63	KITTY HAWK	R	03363	8225	0136	001711992	2471.72	1	2008	09	2471.72	1	0.046296	5
CVN 63	KITTY HAWK	R	03363	8225	0186	002021892	211.07	2	2008	12	422.14	100	6.666666	5
CVN 63	KITTY HAWK	R	03363	8225	0385	002781283	5.21	17	2008	11	88.57	0.29	0.022771	5
CVN 63	KITTY HAWK	R	03363	8225	1072	006871896	37.92	2	2008	09	75.84	0.02	0.010416	5
CVN 63	KITTY HAWK	R	03363	8225	1090	007163246	262.19	8	2008	10	2097.52	0.3	0.028356	5
CVN 63	KITTY HAWK	R	03363	8225	1186	007783368	20.23	10	2008	11	202.3	0.02	0.0003	5
CVN 63	KITTY HAWK	R	03363	8225	1588	009712698	3589.77	4	2008	09	14359.08	170	44.66667	5
CVN 63	KITTY HAWK	R	03363	8226	0011	009769745	75.8	3	2008	10	227.4	0.02	0.00559	5
CVN 63	KITTY HAWK	R	03363	8226	0111	010148971	1.55	132	2008	11	204.6	0.01	0.000063	5
CVN 63	KITTY HAWK	R	03363	8226	0193	010327826	24.13	6	2008	10	144.78	0.14	0.032986	5
CVN 63	KITTY HAWK	R	03363	8226	0199	010335328	41.85	3	2008	10	125.55	0.23	0.021817	5
CVN 63	KITTY HAWK	R	03363	8226	0370	010770803	176.31	9	2008	09	1586.79	0.015	0.005813	5
CVN 63	KITTY HAWK	R	03363	8226	0544	011081156	2.71	21	2008	09	56.91	0.01	0.001458	5
CVN 63	KITTY HAWK	R	03363	8226	0626	011155531	444.85	2	2008	10	889.7	0.35	0.032407	5
CVN 63	KITTY HAWK	R	03363	8226	0654	011162986	1634.51	2	2008	10	3269.02	2.34	0.255664	5
CVN 63	KITTY HAWK	R	03363	8226	0714	011195660	45.83	3	2008	10	137.49	0.9	0.152777	5
CVN 63	KITTY HAWK	R	03363	8226	0721	011198109	30.92	14	2008	10	432.88	9.5	0.248263	5
CVN 63	KITTY HAWK	R	03363	8226	1005	011284510	34.22	5	2008	09	171.1	0.01	0.003544	5
CVN 63	KITTY HAWK	R	03363	8226	1216	011357330	86.18	2	2008	10	172.36	0.2	0.032407	5
CVN 63	KITTY HAWK	R	03363	8226	1225	011361785	0.32	200	2008	10	64	0.001	0.000132	5
CVN 63	KITTY HAWK	R	03363	8226	1231	011364233	45.14	3	2009	01	135.42	0.02	0.000086	5
CVN 63	KITTY HAWK	R	03363	8226	1458	011483592	23.33	9	2008	10	209.97	0.02	0.002	5
CVN 63	KITTY HAWK	R	03363	8226	1474	011506496	433.6	1	2008	10	433.6	0.25	0.003616	5
CVN 63	KITTY HAWK	R	03363	8226	1481	011506744	240.64	5	2008	10	1203.2	1.32	0.079752	5
CVN 63	KITTY HAWK	R	03363	8227	0092	011668555	13.99	6	2008	10	83.94	0.03	0.000406	5
CVN 63	KITTY HAWK	R	03363	8227	0195	011769312	54.04	1	2008	10	54.04	0.027	0.005155	5
CVN 63	KITTY HAWK	R	03363	8227	0345	011915483	436.61	2	2008	10	873.22	0.13	0.010127	5
CVN 63	KITTY HAWK	R	03363	8227	0402	011967440	405.61	3	2008	11	1216.83	7.5	0.199381	5
CVN 63	KITTY HAWK	R	03363	8227	0514	012129550	1441.86	2	2008	11	2883.72	59	4.123148	5
CVN 63	KITTY HAWK	R	03363	8227	0693	012368811	11.46	6	2008	09	68.76	0.02	0.004687	5
CVN 63	KITTY HAWK	R	03363	8227	0876	012631946	29.89	1	2008	11	29.89	0.04	0.000234	5
CVN 63	KITTY HAWK	R	03363	8227	0887	012642853	175.16	5	2008	12	875.8	1.52	0.065972	5
CVN 63	KITTY HAWK	R	03363	8227	0933	012679314	39.33	3	2008	10	117.99	0.02	0.000036	5
CVN 63	KITTY HAWK	R	03363	8227	1166	012950965	205.2	1	2009	01	205.2	0.02	0.007233	5
CVN 63	KITTY HAWK	R	03363	8227	1369	013225918	35.03	2	2008	09	70.06	0.06	0.010986	5
CVN 63	KITTY HAWK	R	03363	8227	1412	013270358	52.77	1	2008	10	52.77	0.02	0.001012	5
CVN 63	KITTY HAWK	R	03363	8227	1492	013360259	2691.83	1	2008	11	2691.83	1.33	0.153971	5
CVN 63	KITTY HAWK	R	03363	8228	0076	013674441	783.25	1	2008	11	783.25	0.1	0.041666	5
CVN 63	KITTY HAWK	R	03363	8228	0079	013678745	11436.21	5	2008	09	57181.05	4	0.295138	5
CVN 63	KITTY HAWK	R	03363	8228	0228	013991079	395.8	1	2008	10	395.8	1.1	0.10949	5
CVN 63	KITTY HAWK	R	03363	8228	0449	014397996	275.38	1	2008	10	275.38	0.1	0.000868	5
CVN 63	KITTY HAWK	R	03363	8228	0779	001006151	279.07	103	2008	10	28744.21	0.275	0.007233	5
CVN 63	KITTY HAWK	R	03363	8228	0845	002686022	29.82	141	2008	09	4204.62	0.37	0.001446	5
CVN 63	KITTY HAWK	R	03363	8228	1032	008272653	12.32	60	2008	09	739.2	0.08	0.00217	5
CVN 63	KITTY HAWK	R	03363	8228	1196	011051395	454.94	1	2008	09	454.94	0.3	0.049479	5
CVN 63	KITTY HAWK	R	03363	8228	1213	011248234	173.5	1	2008	09	173.5	0.02	0.002083	5

CVN 63	KITTY HAWK	R	03363	8228	1363	012278814	222.58	1	2008	09	222.58	4	0.229166	5
CVN 63	KITTY HAWK	R	03363	8237	0482	008733195	1.63	198	2008	09	322.74	0.01	0.003969	5
CVN 63	KITTY HAWK	R	03363	8238	0698	000828263	21.17	4	2008	11	84.68	0.3	0.002343	5
CVN 63	KITTY HAWK	R	03363	8238	0723	001053919	87.5	4	2008	11	350	6	0.296296	5
CVN 63	KITTY HAWK	R	03363	8238	0757	001249079	970.06	2	2008	11	1940.12	0.12	0.009236	5
CVN 63	KITTY HAWK	R	03363	8238	0996	002453424	21.53	5	2008	11	107.65	1.12	0.010633	5
CVN 63	KITTY HAWK	R	03363	8238	1056	002740905	1.84	100	2008	11	184	0.13	0.001039	5
CVN 63	KITTY HAWK	R	03363	8238	1115	002964093	2.49	78	2008	11	194.22	0.05	0.009403	5
CVN 63	KITTY HAWK	R	03363	8238	1145	003174326	668.82	2	2008	11	1337.64	2.455	0.047031	5
CVN 63	KITTY HAWK	R	03363	8238	1224	003836350	687.25	1	2008	11	687.25	1.05	0.028356	5
CVN 63	KITTY HAWK	R	03363	8238	1263	004050608	3510.01	1	2008	12	3510.01	28	1.219685	5
CVN 63	KITTY HAWK	R	03363	8239	0078	006398994	30.71	68	2008	11	2088.28	0.63	0.009837	5
CVN 63	KITTY HAWK	R	03363	8239	0483	009131257	25.2	7	2008	11	176.4	0.075	0.002313	5
CVN 63	KITTY HAWK	R	03363	8239	0505	009199913	170.55	3	2008	11	511.65	1.25	0.0375	5
CVN 63	KITTY HAWK	R	03363	8239	0807	010516693	142.23	1	2008	11	142.23	1.36	0.029453	5
CVN 63	KITTY HAWK	R	03363	8239	0891	010800435	2.18	90	2008	11	196.2	0.02	0.000138	5
CVN 63	KITTY HAWK	R	03363	8239	0900	010853721	75.13	3	2008	11	225.39	0.97	0.058756	5
CVN 63	KITTY HAWK	R	03363	8239	1057	011308657	136.8	1	2008	11	136.8	0.001	0.000014	5
CVN 63	KITTY HAWK	R	03363	8239	1130	011456660	61.86	3	2008	11	185.58	0.001	0.000014	5
CVN 63	KITTY HAWK	R	03363	8239	1256	011649799	209.51	1	2008	11	209.51	0.001	0.000217	5
CVN 63	KITTY HAWK	R	03363	8239	1400	011887743	177.84	1	2008	11	177.84	0.29	0.052083	5
CVN 63	KITTY HAWK	R	03363	8239	1409	011909816	18.31	3	2008	11	54.93	0.16	0.007161	5
CVN 63	KITTY HAWK	R	03363	8239	1433	011968216	320.07	1	2008	11	320.07	1.1	0.032407	5
CVN 63	KITTY HAWK	R	03363	8239	1450	011989990	62.69	1	2008	12	62.69	1.35	0.202546	5
CVN 63	KITTY HAWK	R	03363	8239	1575	012282098	42.59	7	2008	11	298.13	1.02	0.015208	5
CVN 63	KITTY HAWK	R	03363	8240	0106	012610212	361.06	1	2008	11	361.06	1	0.070312	5
CVN 63	KITTY HAWK	R	03363	8240	0139	012723532	110.88	1	2008	11	110.88	0.02	0.00179	5
CVN 63	KITTY HAWK	R	03363	8240	0147	012750565	187.15	5	2008	10	935.75	6.8	0.1875	5
CVN 63	KITTY HAWK	R	03363	8240	0662	014475899	183.79	1	2008	11	183.79	0.08	0.005208	5
CVN 63	KITTY HAWK	R	03363	8248	0712	007595101	188.7	2	2008	11	377.4	0.2	0.002531	5
CVN 63	KITTY HAWK	R	03363	8248	0788	008931046	121.91	1	2009	09	121.91	4.83	0.09375	5
CVN 63	KITTY HAWK	R	03363	8248	1012	011751036	2.25	52	2008	11	117	0.04	0.004866	5
CVN 63	KITTY HAWK	R	03363	8248	1246	013253804	1082.09	1	2008	12	1082.09	18	1.75	5
CVN 63	KITTY HAWK	R	03363	8336	0434	009896265	5.74	9	2009	01	51.66	0.51	0.010416	5
CVN 63	KITTY HAWK	R	03363	8336	0758	014332979	686.48	1	2009	01	686.48	2	1.25	5
CVN 63	KITTY HAWK	R	03363	9110	0113	001067359	1078.53	2	2009	06	2157.06	57.92	3.90625	5
CVN 63	KITTY HAWK	R	03363	9110	0278	002476069	35	3	2009	11	105	18.63	0.998553	5
CVN 63	KITTY HAWK	R	03363	9110	0391	003951213	19.19	6	2009	05	115.14	0.4	0.075468	5
CVN 63	KITTY HAWK	R	03363	9110	0484	005488014	481.81	5	2009	06	2409.05	1.56	0.042777	5
CVN 63	KITTY HAWK	R	03363	9110	0671	008724751	33.73	3	2009	06	101.19	2.34	0.181001	5
CVN 63	KITTY HAWK	R	03363	9110	0927	011175089	2.79	28	2009	05	78.12	0.012	0.006119	5
CVN 63	KITTY HAWK	R	03363	9110	1065	011667193	216.97	1	2009	06	216.97	0.72	0.200115	5
CVN 63	KITTY HAWK	R	03363	9110	1075	011713640	212.16	1	2009	06	212.16	0.26	0.019675	5
CVN 63	KITTY HAWK	R	03363	9110	1169	012276628	126.28	5	2009	05	631.4	0.26	0.058593	5
CVN 63	KITTY HAWK	R	03363	9110	1496	014528445	138.17	1	2009	06	138.17	2.215	0.064453	5
CVN 63	KITTY HAWK	R	03363	9110	1559	014679643	556.87	6	2009	06	3341.22	0.15	0.009259	5
CVN 63	KITTY HAWK	R	03363	9112	1218	012630392	38.66	70	2009	12	2706.2	0.05	0.010416	5
CVN 63	KITTY HAWK	R	03363	9204	1562	011476812	85.26	3	2009	10	255.78	30	3.59375	5
CVN 65	ENTERPRISE	V	03365	0113	0612	009357254	17.95	48	2010	05	861.6	0.07	0.001851	4
CVN 65	ENTERPRISE	V	03365	0113	0697	012219084	15.91	6	2010	06	95.46	0.01	0.000303	4
CVN 65	ENTERPRISE	V	03365	0119	0981	014364010	4051.99	1	2010	06	4051.99	0.3	0.039351	1
CVN 65	ENTERPRISE	V	03365	8025	0293	005543275	36.39	35	2008	03	1273.65	0.04	0.00243	8
CVN 65	ENTERPRISE	V	03365	8025	0310	006891989	212.36	5	2008	03	1061.8	0.032	0.003472	3
CVN 65	ENTERPRISE	V	03365	8025	0368	010052124	1123.76	1	2008	03	1123.76	0	0	3
CVN 65	ENTERPRISE	V	03365	8025	0456	011603591	257.79	6	2008	04	1546.74	0.03	0.001388	7
CVN 65	ENTERPRISE	V	03365	8077	1266	013414332	102.78	8	2008	04	822.24	0.26	0.013226	2
CVN 65	ENTERPRISE	V	03365	8077	1302	007557237	156.04	5	2008	04	780.2	0.1	0.012435	3
CVN 65	ENTERPRISE	V	03365	8077	1348	014180629	725.98	1	2008	04	725.98	0.75	0.020833	7
CVN 65	ENTERPRISE	V	03365	8077	1439	010243258	2.24	284	2008	04	636.16	0.0005	0.000054	7
CVN 65	ENTERPRISE	V	03365	8078	0222	011548567	88.48	5	2008	04	442.4	0.34	0.008101	7
CVN 65	ENTERPRISE	V	03365	8078	0273	005845272	2.84	146	2008	04	414.64	1.25	0.011718	7
CVN 65	ENTERPRISE	V	03365	8078	0493	000509560	85.81	3	2008	04	257.43	3.301	0.312962	3
CVN 65	ENTERPRISE	V	03365	8078	0525	005699501	43.93	7	2008	04	307.51	0.855	0.015972	7
CVN 65	ENTERPRISE	V	03365	8078	0673	011067626	130.82	2	2008	04	261.64	0.02	0.011393	3
CVN 65	ENTERPRISE	V	03365	8078	0759	011638248	0.11	2189	2008	04	240.79	0.005	0.000045	3
CVN 65	ENTERPRISE	V	03365	8078	1324	014552582	69.98	2	2008	04	139.96	2.05	0.208333	3
CVN 65	ENTERPRISE	V	03365	8078	1491	014331074	6.17	20	2008	05	123.4	0.02	0.002097	7
CVN 65	ENTERPRISE	V	03365	8079	0153	009507784	22.11	5	2008	04	110.55	0.15	0.002604	3
CVN 67	KENNEDY	V	03367	0201	0055	004258822	244.01	1	2010	08	244.01	2.55	0.0625	5
CVN 67	KENNEDY	V	03367	0201	0108	010263636	5314.4	1	2010	08	5314.4	1.52	0.212962	5

CVN 68	NIMITZ	R	03368	0161	0103	001167558	769.86	1	2010	09	769.86	0.109	0.015679	3
CVN 68	NIMITZ	R	03368	0161	0195	002439072	1018.34	1	2010	09	1018.34	44.8	2.59875	3
CVN 68	NIMITZ	R	03368	0161	0251	003717981	231.21	1	2010	09	231.21	5.35	0.277777	7
CVN 68	NIMITZ	R	03368	0161	0296	004783083	299.46	2	2010	09	598.92	2.28	0.094039	2
CVN 68	NIMITZ	R	03368	0161	0355	005952598	55.43	1	2010	09	55.43	0.13	0.007808	7
CVN 68	NIMITZ	R	03368	0161	0376	006406823	43.39	2	2010	09	86.78	4.85	0.087546	8
CVN 68	NIMITZ	R	03368	0161	0499	010044162	14.42	4	2010	09	57.68	2.48	0.016203	3
CVN 68	NIMITZ	R	03368	0161	0764	011952555	296.99	2	2010	09	593.98	0.87	0.210069	3
CVN 68	NIMITZ	R	03368	0161	0848	012581154	76.38	10	2010	09	763.8	0.96	0.027777	7
CVN 68	NIMITZ	R	03368	0161	1070	014227298	4.22	63	2010	09	265.86	1	0.003906	3
CVN 68	NIMITZ	R	03368	0161	1101	014437291	1767.1	1	2010	09	1767.1	1.2	0.149739	2
CVN 68	NIMITZ	R	03368	0161	1153	014761557	716.31	1	2010	09	716.31	30	1.084635	2
CVN 69	EISENHOWER	V	03369	8234	0133	009762178	188.29	2	2008	10	376.58	0.07	0.01519	1
CVN 69	EISENHOWER	V	03369	8234	0173	010586493	142.77	1	2008	10	142.77	0.05	0.000578	1
CVN 69	EISENHOWER	V	03369	8234	0194	010914644	183.33	2	2008	10	366.66	0.1	0.056712	1
CVN 69	EISENHOWER	V	03369	8234	0210	011069479	742.29	1	2008	10	742.29	0.78	0.555555	1
CVN 69	EISENHOWER	V	03369	8234	0258	011234329	708.62	1	2008	10	708.62	0.001	0.000014	1
CVN 69	EISENHOWER	V	03369	8234	0282	011278731	334.68	1	2008	10	334.68	0.2	0.001157	1
CVN 69	EISENHOWER	V	03369	8234	0364	011518979	786.6	1	2008	10	786.6	81	0.138888	2
CVN 69	EISENHOWER	V	03369	8234	0478	011912492	15.28	6	2008	10	91.68	0.01	0.000073	1
CVN 69	EISENHOWER	V	03369	8234	0757	013869557	154.97	1	2008	10	154.97	0.037	0.0035	1
CVN 69	EISENHOWER	V	03369	8234	0760	013922357	282.57	1	2008	11	282.57	0.29	0.017361	1
CVN 69	EISENHOWER	V	03369	8234	1077	001942489	28.73	5	2008	10	143.65	0.01	0.000057	1
CVN 69	EISENHOWER	V	03369	8234	1181	010938337	275.48	1	2008	10	275.48	0.35	0.042534	2
CVN 69	EISENHOWER	V	03369	8234	1181	010938337	275.48	1	2008	10	275.48	0.35	0.042534	2
CVN 70	VINSON	R	20993	7275	0064	001265753	2.02	47	2007	10	94.94	0.011	0.000046	6
CVN 70	VINSON	R	20993	7275	0186	002996656	5.68	20	2007	10	113.6	0.07	0.005208	2
CVN 70	VINSON	R	20993	7275	0345	008499839	7.35	38	2007	10	279.3	1.09	0.1125	7
CVN 70	VINSON	R	20993	7275	0461	010605457	615.29	1	2007	10	615.29	0.12	0.011399	7
CVN 70	VINSON	R	20993	7275	0565	011281142	1577.73	1	2007	10	1577.73	0.02	0.034961	7
CVN 70	VINSON	R	20993	7275	0795	012963787	64.23	2	2007	10	128.46	0.5	0.090277	7
CVN 70	VINSON	R	20993	7275	0815	013176196	110.16	2	2007	10	220.32	0.05	0.005	2
CVN 70	VINSON	R	20993	7275	0899	013986005	168.98	1	2007	10	168.98	1	0.121527	3
CVN 70	VINSON	R	20993	7275	0938	014407248	853.74	1	2007	10	853.74	6.95	0.363802	7
CVN 70	VINSON	R	20993	7284	1029	000431947	2.46	52	2007	10	127.92	0.01	0.000111	7
CVN 70	VINSON	R	20993	7284	1081	001138184	5.51	22	2007	10	121.22	0.25	0.003616	7
CVN 70	VINSON	R	20993	7284	1086	001365066	5.26	18	2007	10	94.68	0.82	0.108506	7
CVN 70	VINSON	R	20993	7284	1247	004497416	93.83	1	2007	10	93.83	2	0.034328	7
CVN 70	VINSON	R	20993	7284	1258	004691855	28.99	11	2007	10	318.89	0.47	0.006944	7
CVN 70	VINSON	R	20993	7285	0094	010888185	4202.6	2	2007	11	8405.2	2.75	0.165277	7
CVN 70	VINSON	R	20993	7285	0220	012185192	92.38	3	2007	10	277.14	0.07	0.009259	7
CVN 70	VINSON	R	20993	7285	0315	013177792	1818.47	1	2007	11	1818.47	1	0.12037	1
CVN 70	VINSON	R	20993	7347	1472	008496367	36.81	2	2007	12	73.62	0.12	0.000714	2
CVN 70	VINSON	R	20993	7347	1481	009016262	74.7	1	2008	01	74.7	0.13	0.002604	8
CVN 70	VINSON	R	20993	7348	0209	013866869	48.44	2	2007	12	96.88	0.4	0.019865	8
CVN 70	VINSON	R	20993	7351	0275	003011000	178.2	1	2007	12	178.2	6.84	0.064814	2
CVN 70	VINSON	R	20993	7351	0294	007786427	23.4	5	2007	12	117	0.06	0.031754	7
CVN 70	VINSON	R	20993	8008	0384	001768112	27.69	2	2008	01	55.38	0.005	0.007595	2
CVN 70	VINSON	R	20993	8031	0666	012676319	381.5	1	2008	03	381.5	0	0	7
CVN 70	VINSON	R	20993	8031	0803	000695291	0.85	137	2008	03	116.45	0.045	0.002083	8
CVN 70	VINSON	R	20993	8032	0833	010425270	6060.37	2	2008	02	12120.74	65	2.083333	2
CVN 70	VINSON	R	20993	8032	0859	004682755	778.83	7	2008	03	5451.81	1.33	0.014811	2
CVN 70	VINSON	R	20993	8032	0928	010379844	1360.72	1	2008	03	1360.72	1.3	0.405092	7
CVN 70	VINSON	R	20993	8207	0931	011841105	17197.24	1	2008	08	17197.24	4.15	0.221375	2
CVN 70	VINSON	R	20993	8207	1120	002215453	2129.75	1	2008	08	2129.75	4.21	0.141782	2
CVN 70	VINSON	R	20993	8207	1492	003920503	464.92	1	2008	08	464.92	0.02	0.001203	2
CVN 70	VINSON	R	20993	8208	0096	012420126	328.87	1	2008	08	328.87	0.75	0.012152	2
CVN 70	VINSON	R	20993	8208	0158	008501144	273.68	1	2008	08	273.68	0.46	0.083333	2
CVN 70	VINSON	R	20993	8208	0224	008428409	15.42	15	2008	08	231.3	4	0.296296	2
CVN 70	VINSON	R	20993	8208	0407	007585066	140.47	1	2008	08	140.47	0.02	0.005208	2
CVN 70	VINSON	R	20993	8208	0422	014549401	134.62	1	2008	08	134.62	1.15	0.005972	2
CVN 70	VINSON	R	20993	8208	0430	010578072	6.9	19	2008	08	131.1	0.1	0.002835	2
CVN 70	VINSON	R	20993	8208	0458	011896840	122.82	1	2008	08	122.82	0.085	0.006319	2
CVN 70	VINSON	R	20993	8208	0489	012723532	111.61	1	2008	08	111.61	0.02	0.00179	2
CVN 70	VINSON	R	20993	8208	0491	005071543	11.08	10	2008	08	110.8	0.1	0.010416	2
CVN 70	VINSON	R	20993	8208	0662	013954702	14.12	5	2008	08	70.6	0.04	0.005208	2
CVN 70	VINSON	R	20993	8208	0721	012859981	4.43	14	2008	08	62.02	0.03	0.000361	2
CVN 70	VINSON	R	20993	8208	0731	011775489	15.41	4	2008	08	61.64	0.02	0.000694	2
CVN 70	VINSON	R	20993	8208	0779	002453716	55.08	1	2008	08	55.08	1.35	0.134476	2
CVN 70	VINSON	R	20993	8208	0796	000712944	52.74	1	2008	08	52.74	2.574	1.375	2
CVN 70	VINSON	R	20993	8235	0906	004971684	62.8	4	2008	09	251.2	1.6	0.03125	2

CVN 70	VINSON	R	20993	8235	1004	002090295	4.33	44	2008	09	190.52	0.645	0.002604	2
CVN 70	VINSON	R	20993	8235	1123	002997248	127.58	1	2008	09	127.58	0.2	0.010416	8
CVN 70	VINSON	R	20993	8235	1159	001863542	114.99	1	2008	09	114.99	5.13	0.185185	2
CVN 70	VINSON	R	20993	8235	1162	013387835	14.32	8	2008	09	114.56	0.5	0.014814	2
CVN 70	VINSON	R	20993	8235	1254	014620675	89.51	1	2008	09	89.51	0.32	0.021701	2
CVN 70	VINSON	R	20993	8235	1311	007195401	4.4	17	2008	09	74.8	0.39	0.006076	2
CVN 70	VINSON	R	20993	8256	0005	009062410	16.09	7	2008	11	112.63	0.46	0.037977	2
CVN 70	VINSON	R	20993	8256	0051	010189101	35.72	2	2008	11	71.44	0.05	0.003616	2
CVN 70	VINSON	R	20993	8256	0054	012786230	11.81	6	2008	11	70.86	0.08	0.005841	2
CVN 70	VINSON	R	20993	8256	0136	009464809	6.37	9	2008	11	57.33	0.5	0.047345	2
CVN 70	VINSON	R	20993	8256	0170	006830560	0.25	180	2008	11	45	0.0004	0.000011	1
CVN 70	VINSON	R	20993	8256	0262	007737618	4.31	10	2008	11	43.1	1	0.011574	2
CVN 70	VINSON	R	20993	8256	0386	012632879	13.34	1	2008	11	13.34	0.02	0.00405	8
CVN 70	VINSON	R	20993	8256	0451	002343079	181.93	1	2008	11	181.93	0.66	0.028125	2
CVN 70	VINSON	R	20993	8256	0457	002487445	7.03	77	2008	11	541.31	0.1	0.000578	2
CVN 70	VINSON	R	20993	8256	0521	004507385	401.47	2	2008	11	802.94	1	0.04956	2
CVN 70	VINSON	R	20993	8256	0897	011207584	60.78	4	2008	11	243.12	0.13	0.006944	2
CVN 70	VINSON	R	20993	8256	0902	011227326	103.97	1	2008	11	103.97	0.14	0.005425	2
CVN 70	VINSON	R	20993	8256	0972	011714189	899.06	1	2008	11	899.06	6	0.150417	2
CVN 70	VINSON	R	20993	8256	1198	013278099	11.08	12	2008	11	132.96	0.3	0.023437	2
CVN 70	VINSON	R	20993	8256	1405	014618525	803.99	1	2008	09	803.99	0	0	2
CVN 70	VINSON	R	20993	8256	1425	014686283	124.85	1	2008	11	124.85	1.4	0.027777	2
CVN 70	VINSON	R	20993	9283	0005	001515379	67.97	6	2009	12	407.82	0.05	0.012297	8
CVN 70	VINSON	R	20993	9283	0328	011866729	5.31	8	2009	11	42.48	0.1	0.000925	8
CVN 70	VINSON	R	20993	9283	0663	011431670	0.48	24	2009	10	11.52	0.01	0.000648	8
CVN 70	VINSON	R	20993	9283	0744	011705668	2.8	3	2009	10	8.4	0.025	0.001118	1
CVN 70	VINSON	R	20993	9283	0803	006117136	3.36	2	2009	11	6.72	0.1	0.001157	1
CVN 70	VINSON	R	20993	9283	0826	012046051	1.26	5	2009	10	6.3	0.01	0.000115	8
CVN 70	VINSON	R	20993	9283	0931	004893267	0.83	5	2009	10	4.15	0.026	0.000227	1
CVN 70	VINSON	R	20993	9283	0982	012678900	3.33	1	2009	11	3.33	0.008	0.007407	8
CVN 70	VINSON	R	20993	9283	1202	010438882	1.39	1	2009	11	1.39	0.01	0.000162	1
CVN 70	VINSON	R	20993	9283	1221	010493123	0.25	5	2009	10	1.25	0.01	0.000651	1
CVN 70	VINSON	R	20993	9283	1252	012421016	0.18	6	2009	11	1.08	0	0	8
CVN 70	VINSON	R	20993	9283	1283	009587667	0.3	3	2009	10	0.9	0.02	0.000092	1
CVN 70	VINSON	R	20993	9283	1348	000642570	0.14	4	2009	11	0.56	0.0001	0.000011	1
CVN 71	ROOSEVELT	V	21247	7285	0039	001004932	52.74	9	2008	06	474.66	0.11	0.009837	3
CVN 71	ROOSEVELT	V	21247	7285	0059	010919955	51.15	10	2008	06	511.5	0.1	0.007813	1
CVN 71	ROOSEVELT	V	21247	7310	0673	000120809	5.62	21	2007	12	118.02	0.03	0.001041	8
CVN 71	ROOSEVELT	V	21247	7310	0674	000217222	363.52	1	2008	01	363.52	0.09	0.042317	1
CVN 71	ROOSEVELT	V	21247	7310	0847	002221568	27.83	1	2007	12	27.83	0.02	0.00014	1
CVN 71	ROOSEVELT	V	21247	7310	0882	002725700	1.56	36	2008	01	56.16	0.04	0.000087	7
CVN 71	ROOSEVELT	V	21247	7310	0949	004092928	480.57	3	2007	12	1441.71	0.17	0.025	1
CVN 71	ROOSEVELT	V	21247	7310	0985	004611599	2040.54	1	2008	01	2040.54	2.84	0.101725	1
CVN 71	ROOSEVELT	V	21247	7310	1166	008107251	85.44	1	2008	01	85.44	0.075	0.000583	1
CVN 71	ROOSEVELT	V	21247	7310	1275	009622195	310.04	4	2007	12	1240.16	0.24	0.003819	1
CVN 71	ROOSEVELT	V	21247	7311	0098	011289045	1213.5	2	2007	12	2427	0.4	0.07673	1
CVN 71	ROOSEVELT	V	21247	7311	0101	011290929	124.68	1	2007	12	124.68	0.1	0.019061	1
CVN 71	ROOSEVELT	V	21247	7311	0227	011544781	538.18	1	2007	12	538.18	0.2	0.013671	1
CVN 71	ROOSEVELT	V	21247	7311	0310	011677312	1074.52	6	2007	12	6447.12	0.065	0.062414	1
CVN 71	ROOSEVELT	V	21247	7311	0447	012223483	167.8	1	2008	01	167.8	1.16	0.166666	1
CVN 71	ROOSEVELT	V	21247	7311	0585	012951970	1148.78	5	2008	01	5743.9	4.4	0.436064	1
CVN 71	ROOSEVELT	V	21247	7311	0587	012952378	137.7	1	2008	01	137.7	1.26	0.251736	7
CVN 71	ROOSEVELT	V	21247	7311	1283	007637989	193.1	2	2007	12	386.2	0.1	0.006076	1
CVN 71	ROOSEVELT	V	21247	7311	1373	009922812	368.95	1	2007	12	368.95	0.15	0.00405	1
CVN 71	ROOSEVELT	V	21247	7312	0064	011345872	111.07	1	2007	12	111.07	0.25	0.005208	1
CVN 71	ROOSEVELT	V	21247	7312	0195	011952409	672.36	3	2007	12	2017.08	3.25	1.527777	1
CVN 71	ROOSEVELT	V	21247	7312	0456	013669401	1133.99	1	2007	12	1133.99	0.09	0.012152	1
CVN 71	ROOSEVELT	V	21247	7312	0550	014665197	113.39	4	2007	12	453.56	1	0.011574	1
CVN 71	ROOSEVELT	V	21247	7353	1358	003132468	637.06	24	2008	07	15289.44	0.02	0.011574	1
CVN 71	ROOSEVELT	V	21247	7353	1443	000040225	4153.03	4	2008	06	16612.12	1	0.047241	1
CVN 71	ROOSEVELT	V	21247	7353	1405Y	009484151	9.23	34	2008	07	313.82	1.47	0.012532	8
CVN 71	ROOSEVELT	V	21247	7354	0239	012591672	2242.19	1	2008	06	2242.19	0.26	0.65625	1
CVN 71	ROOSEVELT	V	21247	7355	0341	000058060	378.68	5	2008	06	1893.4	0.001	0.000014	1
CVN 71	ROOSEVELT	V	21247	7355	0365	010457804	898.76	2	2008	06	1797.52	0.09	0.000868	1
CVN 71	ROOSEVELT	V	21247	7355	0428	010072625	527.76	3	2008	06	1583.28	0.21	0.013888	1
CVN 71	ROOSEVELT	V	21247	7356	0486	004349094	577.27	2	2008	06	1154.54	0.475	0.020833	1
CVN 71	ROOSEVELT	V	21247	7356	0524	011952408	966.91	1	2008	06	966.91	0.5	0.098741	1

CVN 71	ROOSEVELT	V	21247	7356	0563	000974044	344.96	3	2008	06	1034.88	0.1	0.003472	1
CVN 71	ROOSEVELT	V	21247	8036	0023	010696764	395.2	1	2008	04	395.2	3.38	0.152777	3
CVN 71	ROOSEVELT	V	21247	8036	0027	013922641	736.7	1	2008	04	736.7	18.46	0.669921	2
CVN 71	ROOSEVELT	V	21247	0049	0384	013022656	348.15	10	2010	04	3481.5	0.25	0.022685	2
CVN 71	ROOSEVELT	V	21247	0049	0594	012921047	23.06	7	2010	03	161.42	0.4	0.05	2
CVN 71	ROOSEVELT	V	21247	0070	0418	013744881	13052.38	1	2010	05	13052.38	0.6	0.060836	1
CVN 71	ROOSEVELT	V	21247	0070	0480	011922913	5015.74	2	2010	04	10031.48	1.03	0.055555	1
CVN 71	ROOSEVELT	V	21247	0070	0892	011606801	767.06	5	2010	05	3835.3	0.25	0.007473	1
CVN 71	ROOSEVELT	V	21247	0070	1234	011958736	592.2	4	2010	04	2368.8	1	0.364583	3
CVN 71	ROOSEVELT	V	21247	0070	1300	009342800	726.25	3	2010	04	2178.75	0.04	0.00868	1
CVN 71	ROOSEVELT	V	21247	0070	1453	012167872	1859.38	1	2010	04	1859.38	1.78	0.09299	2
CVN 71	ROOSEVELT	V	21247	0071	0035	002386598	1717.15	1	2010	04	1717.15	0.18	0.017361	1
CVN 71	ROOSEVELT	V	21247	0071	0241	001498007	707.81	2	2010	04	1415.62	0.255	0.028564	1
CVN 71	ROOSEVELT	V	21247	0071	0319	001145601	659.4	2	2010	04	1318.8	0.52	0.033171	2
CVN 71	ROOSEVELT	V	21247	0071	0456	004656386	20.66	57	2010	04	1177.62	1.5	0.004953	2
CVN 71	ROOSEVELT	V	21247	0071	0481	011142450	385.62	3	2010	05	1156.86	0.03	0.010127	2
CVN 71	ROOSEVELT	V	21247	0071	1301	011076848	627.45	1	2010	04	627.45	0.06	0.004	1
CVN 71	ROOSEVELT	V	21247	0071	1303	012085915	626.84	1	2010	04	626.84	0.01	0.009259	1
CVN 71	ROOSEVELT	V	21247	0071	1361	011542568	302.08	2	2010	04	604.16	1	0.021412	1
CVN 71	ROOSEVELT	V	21247	0071	1364	013757777	603.48	1	2010	04	603.48	0.16	0.015972	1
CVN 71	ROOSEVELT	V	21247	0071	1413	010720801	583.25	1	2010	04	583.25	1	0.027777	1
CVN 71	ROOSEVELT	V	21247	0072	0044	012064385	536.45	1	2010	03	536.45	3	0.079119	2
CVN 71	ROOSEVELT	V	21247	0072	0159	013678902	252	2	2010	03	504	0.1	0.01252	8
CVN 71	ROOSEVELT	V	21247	0072	0215	000964398	488.05	1	2010	04	488.05	0.08	0.015914	1
CVN 71	ROOSEVELT	V	21247	0072	0248	010712404	59.67	8	2010	05	477.36	0.72	0.130208	1
CVN 71	ROOSEVELT	V	21247	0072	0352	001145597	221.2	2	2010	05	442.4	0.46	0.006944	2
CVN 71	ROOSEVELT	V	21247	0072	0413	015212341	427.12	1	2010	05	427.12	3	0.020833	1
CVN 71	ROOSEVELT	V	21247	0072	0477	003258978	414.34	1	2010	05	414.34	1.55	0.231481	1
CVN 71	ROOSEVELT	V	21247	0072	0627	013050763	23.9	16	2010	05	382.4	0.01	0.000144	1
CVN 71	ROOSEVELT	V	21247	0072	0842	011431508	333.83	1	2010	05	333.83	13	0.190109	2
CVN 71	ROOSEVELT	V	21247	0073	0152	994988569	42.39	5	2010	04	211.95	1.77	0.054877	1
CVN 71	ROOSEVELT	V	21247	0073	0232	010936690	204.45	1	2010	05	204.45	0.03	0.021267	1
CVN 71	ROOSEVELT	V	21247	0073	0244	002405364	16.95	12	2010	04	203.4	0.72	0.006555	7
CVN 71	ROOSEVELT	V	21247	0073	0457	014130321	181.57	1	2010	04	181.57	1.25	0.017361	2
CVN 71	ROOSEVELT	V	21247	0073	0473	014183389	180.22	1	2010	04	180.22	1.72	0.030135	2
CVN 71	ROOSEVELT	V	21247	0073	0820	011599716	153.42	1	2010	04	153.42	0.35	0.041377	2
CVN 71	ROOSEVELT	V	21247	0073	1189	011784447	130.85	1	2010	05	130.85	0.1	0.002083	1
CVN 71	ROOSEVELT	V	21247	0073	1210	012238717	129.78	1	2010	04	129.78	0.25	0.020833	2
CVN 71	ROOSEVELT	V	21247	0073	1339	013650776	122.5	1	2010	04	122.5	0.2766	0.03125	1
CVN 71	ROOSEVELT	V	21247	0073	1346	014806588	121.8	1	2010	05	121.8	0.3	0.023437	2
CVN 71	ROOSEVELT	V	21247	0073	1441	011472825	117.47	1	2010	05	117.47	0.18	0.011284	1
CVN 71	ROOSEVELT	V	21247	0074	0289	011715955	10.19	10	2010	04	101.9	0.01	0.000144	1
CVN 71	ROOSEVELT	V	21247	0074	0381	010149547	98.7	1	2010	04	98.7	0.02	0.002314	2
CVN 71	ROOSEVELT	V	21247	0074	0383	014418567	98.7	1	2010	05	98.7	0.0001	0.000007	2
CVN 71	ROOSEVELT	V	21247	0074	0450	009723299	5.68	17	2010	05	96.56	0.02	0.001388	1
CVN 71	ROOSEVELT	V	21247	0074	0593	001111679	0.77	110	2010	04	84.7	0.001	0.00001	1
CVN 71	ROOSEVELT	V	21247	0074	0714	013627043	6.73	13	2010	04	87.49	0.9	0.027126	3
CVN 71	ROOSEVELT	V	21247	0074	0832	011258323	83.82	1	2010	04	83.82	0.16	0.002893	3
CVN 71	ROOSEVELT	V	21247	0074	0930	011993211	80.96	1	2010	04	80.96	0.04	0.001782	1
CVN 71	ROOSEVELT	V	21247	0074	1078	000459505	19.18	4	2010	05	76.72	2.2	0.069444	3
CVN 71	ROOSEVELT	V	21247	0074	1098	014552582	76.14	1	2010	04	76.14	2.05	0.208333	1
CVN 71	ROOSEVELT	V	21247	0074	1260	011487302	23.97	3	2010	03	71.91	0.07	0.000462	1
CVN 71	ROOSEVELT	V	21247	0074	1296	011310249	70.97	1	2010	04	70.97	16	0.925925	3
CVN 71	ROOSEVELT	V	21247	0074	1322	002424403	14.56	5	2010	04	72.8	1	0.144675	3
CVN 71	ROOSEVELT	V	21247	0075	0032	015089326	16.22	4	2010	05	64.88	0.1	0.002604	1
CVN 71	ROOSEVELT	V	21247	0075	0131	014130775	62.84	1	2010	05	62.84	0.01	0.038194	1
CVN 71	ROOSEVELT	V	21247	0075	0242	002252662	15.1	4	2010	04	60.4	1.152	0.027647	2
CVN 71	ROOSEVELT	V	21247	0075	0299	012996483	59.32	1	2010	05	59.32	0.18	0.011111	2
CVN 71	ROOSEVELT	V	21247	0075	0351	006109526	4.87	11	2010	04	53.57	1.35	2.005208	3
CVN 71	ROOSEVELT	V	21247	0075	0404	004009858	19.18	3	2010	05	57.54	0.02	0.002929	1
CVN 71	ROOSEVELT	V	21247	0075	0449	014486757	56.67	1	2010	04	56.67	0.1	0.074074	2
CVN 71	ROOSEVELT	V	21247	0075	0450	011786795	56.64	1	2010	04	56.64	1.26	0.039966	2
CVN 71	ROOSEVELT	V	21247	0077	0842	012392135	3906.84	4	2010	04	15627.36	122	1.831828	3
CVN 71	ROOSEVELT	V	21247	0077	0876	008726942	135.8	4	2010	03	543.2	1	0.00868	2
CVN 72	LINCOLN	R	21297	9162	0721	009267655	233.58	1	2009	10	233.58	1.71	0.25	1

CVN 72	LINCOLN	R	21297	9162	0741	012929811	290.49	1	2009	11	290.49	0.5	0.036603	4
CVN 72	LINCOLN	R	21297	9336	0775	000528832	20.05	4	2010	04	80.2	0.94	0.045937	3
CVN 72	LINCOLN	R	21297	9336	1230	013782601	3.57	70	2010	04	249.9	0.001	0.000141	3
CVN 72	LINCOLN	R	21297	9336	1259	014384725	50.93	1	2010	04	50.93	6.62	0.243489	2
CVN 73	WASHINGTON	R	21412	7317	1091	000389365	165.78	6	2007	12	994.68	0.24	0.010172	2
CVN 73	WASHINGTON	R	21412	7317	1190	001609511	16.43	36	2007	12	591.48	0.02	0.016203	2
CVN 73	WASHINGTON	R	21412	7317	1268	002394802	132.53	2	2007	12	265.06	0.3	0.004629	2
CVN 73	WASHINGTON	R	21412	7317	1297	002786969	59.62	31	2008	01	1848.22	2.76	0.051041	2
CVN 73	WASHINGTON	R	21412	7317	1473	005587808	169.04	2	2007	12	338.08	0.02	0.000474	2
CVN 73	WASHINGTON	R	21412	7318	0240	009474010	162.49	2	2007	12	324.98	0.22	0.023066	2
CVN 73	WASHINGTON	R	21412	7318	0242	009488189	228.71	1	2008	01	228.71	0.12	0.018981	2
CVN 73	WASHINGTON	R	21412	7318	0425	011222173	104.82	4	2007	12	419.28	1.73	0.048611	2
CVN 73	WASHINGTON	R	21412	7318	0506	011631100	2335.72	1	2007	12	2335.72	3.67	0.053	2
CVN 73	WASHINGTON	R	21412	7318	0670	012615046	429.83	2	2008	08	859.66	13	1.564814	2
CVN 73	WASHINGTON	R	21412	7318	0996	015049986	966.59	1	2007	12	966.59	0.2	0.020833	2
CVN 73	WASHINGTON	R	21412	7318	1000	015121594	196.66	1	2007	12	196.66	1	0.005208	2
CVN 73	WASHINGTON	R	21412	7318	1006	001003319	1945.7	1	2008	04	1945.7	14	0.700231	2
CVN 73	WASHINGTON	R	21412	7333	0601	010927003	5094.73	3	2008	05	15284.19	1	0.034722	1
CVN 73	WASHINGTON	R	21412	7333	0706	012364728	6478.04	3	2008	06	19434.12	12	0.903862	1
CVN 73	WASHINGTON	R	21412	7333	0761	013154233	1107.4	6	2008	05	6644.4	0.4	0.037037	1
CVN 73	WASHINGTON	R	21412	7355	0001	000793817	420.32	3	2008	02	1260.96	0.1	0.001157	1
CVN 73	WASHINGTON	R	21412	7355	0235	001462559	345.63	1	2008	02	345.63	0.92	0.001736	2
CVN 73	WASHINGTON	R	21412	7355	0333	001697849	194.21	4	2008	03	776.84	0.04	0.006944	1
CVN 73	WASHINGTON	R	21412	7355	0592	002835280	5.51	191	2008	02	1052.41	0.25	0.002025	2
CVN 73	WASHINGTON	R	21412	7355	0625	002915960	39.29	6	2008	02	235.74	0.29	0.009792	2
CVN 73	WASHINGTON	R	21412	7355	0634	002948078	35.22	4	2008	02	140.88	0.04	0.003541	1
CVN 73	WASHINGTON	R	21412	7355	0647	002994104	21.64	5	2008	02	108.2	0.06	0.006944	1
CVN 73	WASHINGTON	R	21412	7355	0890	004217502	2909.6	1	2008	03	2909.6	22.52	0.481481	2
CVN 73	WASHINGTON	R	21412	7355	1010	004707557	20.22	10	2008	02	202.2	0.024	0.002612	1
CVN 73	WASHINGTON	R	21412	7355	1320	005840672	15.9	27	2008	02	429.3	1.07	0.016927	1
CVN 73	WASHINGTON	R	21412	7355	1345	005980146	0.48	362	2008	02	173.76	0.01	0.000057	1
CVN 73	WASHINGTON	R	21412	7355	1359	006029467	333.33	2	2008	02	666.66	0.12	0.013	1
CVN 73	WASHINGTON	R	21412	7355	1399	006322002	14.11	37	2008	03	522.07	0.1	0.006058	1
CVN 73	WASHINGTON	R	21412	7356	0059	007732784	8.26	13	2008	02	107.38	0.01	0.004427	2
CVN 73	WASHINGTON	R	21412	7356	0168	008333897	17.03	79	2008	03	1345.37	0.76	0.004575	1
CVN 73	WASHINGTON	R	21412	7356	0232	008632102	94.32	9	2008	02	848.88	0.1	0.009223	1
CVN 73	WASHINGTON	R	21412	7356	0290	008841344	4.7	100	2008	02	470	0.01	0.001627	2
CVN 73	WASHINGTON	R	21412	7356	0361	009071341	939.25	4	2008	10	3757	0.1	0.014467	1
CVN 73	WASHINGTON	R	21412	7356	0743	010261140	42.02	19	2008	02	798.38	0.03	0.013888	1
CVN 73	WASHINGTON	R	21412	7356	0792	010328300	5.84	26	2008	02	151.84	0.04	0.000358	1
CVN 73	WASHINGTON	R	21412	7356	0806	010341885	24.14	26	2008	02	627.64	0.4	0.009114	1
CVN 73	WASHINGTON	R	21412	7356	1218	011043919	17.98	10	2008	02	179.8	0.04	0.000578	1
CVN 73	WASHINGTON	R	21412	7356	1401	011199685	2175.66	1	2008	02	2175.66	0.595	0.093569	1
CVN 73	WASHINGTON	R	21412	7356	1482	011257581	1279.85	3	2008	02	3839.55	0.3	0.057128	1
CVN 73	WASHINGTON	R	21412	7356	1483	011257592	325.18	1	2008	02	325.18	0.34	0.013888	1
CVN 73	WASHINGTON	R	21412	7357	0102	011320790	85.31	7	2008	02	597.17	0.34	0.036367	1
CVN 73	WASHINGTON	R	21412	7357	0272	011465905	1613.27	1	2008	03	1613.27	15	0.65625	2
CVN 73	WASHINGTON	R	21412	7357	0462	011614249	224.95	1	2008	02	224.95	0.46	0.014322	1
CVN 73	WASHINGTON	R	21412	7357	0830	012015955	995.31	1	2008	02	995.31	0	0	1
CVN 73	WASHINGTON	R	21412	7357	1028	012298000	71.16	16	2008	02	1138.56	0.66	0.024305	1
CVN 73	WASHINGTON	R	21412	7357	1093	012422316	119.08	1	2008	02	119.08	5	1.130208	2
CVN 73	WASHINGTON	R	21412	7357	1280	012725604	239.58	10	2008	02	2395.8	0.36	0.016203	1
CVN 73	WASHINGTON	R	21412	7358	0238	013574417	308.14	2	2008	02	616.28	0.14	0.011574	1
CVN 73	WASHINGTON	R	21412	7358	0241	013589614	387.09	2	2008	02	774.18	0.5	0.040509	1
CVN 73	WASHINGTON	R	21412	7358	0383	013935733	89.46	9	2008	02	805.14	0.02	0.008463	1
CVN 73	WASHINGTON	R	21412	7358	0658	014756604	757.35	1	2008	02	757.35	1	0.15625	1
CVN 73	WASHINGTON	R	21412	7358	0750	000018836	172.13	6	2008	05	1032.78	0.01	0.001	1
CVN 73	WASHINGTON	R	21412	7358	0786	000050472	249.17	2	2008	05	498.34	0.009	0.003441	1
CVN 73	WASHINGTON	R	21412	7358	0873	000574593	8.7	54	2008	05	469.8	0.52	0.005333	2
CVN 73	WASHINGTON	R	21412	7358	0957	001048293	1045.32	1	2008	05	1045.32	0.1	0.049392	1
CVN 73	WASHINGTON	R	21412	7358	1216	002698956	3217.87	2	2008	05	6435.74	3.84	0.083333	2
CVN 73	WASHINGTON	R	21412	7358	1264	003001889	77.75	5	2008	05	388.75	0.02	0.000578	1
CVN 73	WASHINGTON	R	21412	7359	0337	006272513	606.51	3	2008	05	1819.53	40.84	0.33449	2
CVN 73	WASHINGTON	R	21412	7359	0677	009568444	543.93	3	2008	05	1631.79	1.04	0.019097	2
CVN 73	WASHINGTON	R	21412	7359	0790	010113404	76.51	3	2008	05	229.53	0.06	0.000231	1
CVN 73	WASHINGTON	R	21412	7359	0934	010460470	106.5	1	2008	05	106.5	0.01	0.001	2
CVN 73	WASHINGTON	R	21412	7359	1024	010708976	19.03	88	2008	04	1674.64	0.03	0.003255	1
CVN 73	WASHINGTON	R	21412	7359	1092	010992709	177.5	1	2008	05	177.5	0.01	0.000021	1
CVN 73	WASHINGTON	R	21412	7359	1302	011570364	1243.64	1	2008	05	1243.64	1	0.036458	2
CVN 73	WASHINGTON	R	21412	7360	0059	012116722	103.72	4	2008	05	414.88	0.29	0.003	2

CVN 73	WASHINGTON	R	21412	7360	0061	012120039	46.84	3	2008	04	140.52	0.04	0.007	1
CVN 73	WASHINGTON	R	21412	7360	0139	012321101	385.55	1	2008	05	385.55	9.18	0.25	2
CVN 73	WASHINGTON	R	21412	7360	0288	012742742	157.69	3	2008	05	473.07	0.243	0.000422	1
CVN 73	WASHINGTON	R	21412	7360	0391	012997173	271.27	2	2008	05	542.54	25	0.243055	2
CVN 73	WASHINGTON	R	21412	7360	0520	013422607	40.65	3	2008	05	121.95	0.02	0.002314	2
CVN 73	WASHINGTON	R	21412	7360	0586	013659037	1619.35	1	2008	05	1619.35	2	0.052083	2
CVN 73	WASHINGTON	R	21412	7360	0673	013893105	194.98	3	2008	05	584.94	0.54	0.062815	2
CVN 73	WASHINGTON	R	21412	7360	0681	013943413	123.93	2	2008	04	247.86	0.06	0.060763	2
CVN 73	WASHINGTON	R	21412	7360	0864	014422531	80.2	2	2008	05	160.4	0.02	0.002777	1
CVN 74	STENNIS	R	21847	7347	0133	000089844	125.31	1	2008	02	125.31	0.42	0.010416	1
CVN 74	STENNIS	R	21847	7347	0245	000925428	82.62	8	2008	02	660.96	0.05	0.01085	1
CVN 74	STENNIS	R	21847	7347	0346	001697898	1671.99	1	2008	02	1671.99	0.78	0.046875	1
CVN 74	STENNIS	R	21847	7347	0543	003710446	98.7	2	2008	02	197.4	0.04	0.002604	1
CVN 74	STENNIS	R	21847	7347	0611	004660740	10.81	7	2008	03	75.67	0.01	0.000108	1
CVN 74	STENNIS	R	21847	7347	0647	005035896	84.63	3	2008	03	253.89	0.08	0.007595	1
CVN 74	STENNIS	R	21847	7347	0665	005262074	45.03	3	2008	02	135.09	0.1	0.007118	1
CVN 74	STENNIS	R	21847	7347	0744	007350732	21.65	53	2008	03	1147.45	1.47	0.058304	3
CVN 74	STENNIS	R	21847	7347	0765	007969680	495.69	3	2008	02	1487.07	2.85	0.065388	1
CVN 74	STENNIS	R	21847	7347	0826	009073607	11963.5	1	2008	03	11963.5	2	1.953125	1
CVN 74	STENNIS	R	21847	7347	0854	009362138	14.11	6	2008	02	84.66	0.4	0.028165	3
CVN 74	STENNIS	R	21847	7347	0855	009362139	17.67	9	2008	02	159.03	0.26	0.025781	1
CVN 74	STENNIS	R	21847	7347	0972	010245003	861.21	1	2008	03	861.21	1.4	0.5	3
CVN 74	STENNIS	R	21847	7347	1173	011176373	688.55	1	2008	02	688.55	0.12	0.007651	1
CVN 74	STENNIS	R	21847	7347	1179	011193288	1.38	179	2008	02	247.02	0.01	0.00052	3
CVN 74	STENNIS	R	21847	7347	1269	011383178	315.64	10	2008	02	3156.4	0.01	0.004557	3
CVN 74	STENNIS	R	21847	7347	1360	011614201	1382.64	2	2008	03	2765.28	2	0.578703	1
CVN 74	STENNIS	R	21847	7348	0100	012643346	9081.32	1	2008	03	9081.32	1.82	0.104166	1
CVN 74	STENNIS	R	21847	7348	0231	013120631	155.66	24	2008	03	3735.84	0.03	0.001671	3
CVN 74	STENNIS	R	21847	7348	0314	013448258	931.68	3	2008	02	2795.04	0.66	0.006944	1
CVN 74	STENNIS	R	21847	7348	0449	014089001	163.24	1	2008	02	163.24	0.3	0.074074	1
CVN 74	STENNIS	R	21847	7348	0459	014143589	1917	3	2008	02	5751	0.29	0.033854	1
CVN 74	STENNIS	R	21847	7351	0028	002858104	859.24	1	2008	03	859.24	0.2	0.056423	1
CVN 74	STENNIS	R	21847	7351	0107	003730218	5.47	28	2008	02	153.16	0.02	0.001	3
CVN 74	STENNIS	R	21847	7351	0210	004873879	1959.74	2	2008	03	3919.48	0.3	0.277777	1
CVN 74	STENNIS	R	21847	7351	0259	005125269	75.5	2	2008	03	151	0.15	0.009837	1
CVN 74	STENNIS	R	21847	7351	0325	006602215	18.46	115	2008	03	2122.9	0.025	0.000231	1
CVN 74	STENNIS	R	21847	7351	0442	009773143	8.23	24	2008	02	197.52	0.03	0.006944	1
CVN 74	STENNIS	R	21847	7351	0499	010110881	1136	1	2008	02	1136	0	0	1
CVN 74	STENNIS	R	21847	7351	0694	010965613	19.03	6	2008	02	114.18	0.2	0.001041	1
CVN 74	STENNIS	R	21847	7351	0875	011977904	220.43	5	2008	02	1102.15	0.21	0.026909	1
CVN 74	STENNIS	R	21847	9223	1407	013941710	126.35	1	2009	12	126.35	0.22	0.016	8
CVN 74	STENNIS	R	21847	9336	1209	001003529	11.25	23	2010	06	258.75	0.54	0.003343	3
CVN 74	STENNIS	R	21847	9336	1286	001506470	1748.6	1	2010	06	1748.6	0.26	0.083333	1
CVN 74	STENNIS	R	21847	9336	1379	002406487	16.23	15	2010	07	243.45	0.1	0.001359	2
CVN 74	STENNIS	R	21847	9336	1413	002738255	9.59	2	2010	08	19.18	0.095	0.002777	1
CVN 74	STENNIS	R	21847	9336	1489	003280566	74.16	1	2010	06	74.16	0.02	0.004133	1
CVN 74	STENNIS	R	21847	9337	0070	004302921	64.64	2	2010	06	129.28	0.05	0.015625	1
CVN 74	STENNIS	R	21847	9337	0213	005210403	805.11	1	2010	06	805.11	0.035	0.026041	1
CVN 74	STENNIS	R	21847	9337	0378	008052222	15.93	9	2010	06	143.37	0.14	0.004747	1
CVN 74	STENNIS	R	21847	9337	0389	008264023	0.11	1110	2010	06	122.1	0.01	0.0001	1
CVN 74	STENNIS	R	21847	9337	0553	010041934	1855.01	1	2010	06	1855.01	0.87	0.027777	2
CVN 74	STENNIS	R	21847	9337	0575	010112918	14.85	14	2010	03	207.9	0.02	0.000289	2
CVN 74	STENNIS	R	21847	9337	0680	010428233	393.39	4	2010	06	1573.56	1.34	0.048087	2
CVN 74	STENNIS	R	21847	9337	0836	011151122	955.98	1	2010	06	955.98	0.3	0.020845	2
CVN 74	STENNIS	R	21847	9337	1091	011522637	1471.96	1	2010	06	1471.96	1.63	0.335015	1
CVN 74	STENNIS	R	21847	9337	1410	012570360	2016.3	3	2010	06	6048.9	0.25	0.091666	1
CVN 74	STENNIS	R	21847	9337	1428	012635333	2432.25	2	2010	06	4864.5	2.38	0.4256	1
CVN 74	STENNIS	R	21847	9338	0267	013822069	2279.77	1	2010	06	2279.77	0.1	0.004629	1
CVN 74	STENNIS	R	21847	9338	0424	014642292	29.4	8	2010	06	235.2	2.06	0.018518	3
CVN 74	STENNIS	R	21847	9338	0481	015042403	1884.32	2	2010	06	3768.64	5.2	0.662037	1
CVN 74	STENNIS	R	21847	0063	0518	001359645	64.05	2	2010	05	128.1	0.95	1.518717	2
CVN 74	STENNIS	R	21847	0063	0578	007836949	136.3	18	2010	05	2453.4	0.61	0.028935	4
CVN 74	STENNIS	R	21847	0063	0767	013631212	96.82	2	2010	05	193.64	1.8	0.026041	3
CVN 74	STENNIS	R	21847	0063	0771	013652081	45.93	2	2010	05	91.86	0.5	0.625	4
CVN 74	STENNIS	R	21847	0063	0826	014684639	79.6	1	2010	05	79.6	0	0	8

CVN 74	STENNIS	R	21847	0063	0837	014818618	217.06	2	2010	05	434.12	0	0	4
CVN 75	TRUMAN	V	21853	9091	1411	000076103	13.23	9	2009	07	119.07	0.05	0.001736	3
CVN 75	TRUMAN	V	21853	9092	0083	001235821	729.35	1	2009	06	729.35	0.64	0.03177	1
CVN 75	TRUMAN	V	21853	9092	0147	001670810	25.11	4	2009	07	100.44	1.42	0.014919	1
CVN 75	TRUMAN	V	21853	9092	0201	002158010	13.78	6	2009	07	82.68	0.06	0.007812	1
CVN 75	TRUMAN	V	21853	9092	0238	002521690	70.34	1	2009	08	70.34	0.13	0.008101	2
CVN 75	TRUMAN	V	21853	9092	0340	003295490	708.89	1	2009	06	708.89	0.01	0.001	1
CVN 75	TRUMAN	V	21853	9092	0366	003638840	12.62	15	2009	10	189.3	0.2	0.004629	2
CVN 75	TRUMAN	V	21853	9092	0436	004327043	51.98	1	2009	07	51.98	0.15	0.00375	1
CVN 75	TRUMAN	V	21853	9092	0578	005957652	71.75	1	2009	07	71.75	0.65	0.009259	1
CVN 75	TRUMAN	V	21853	9092	0682	007765062	15.08	10	2009	07	150.8	0.1	0.011718	1
CVN 75	TRUMAN	V	21853	9092	0714	008391245	83.23	1	2009	06	83.23	1	0.016203	1
CVN 75	TRUMAN	V	21853	9092	0797	009338335	493.85	2	2009	06	987.7	0.54	0.072337	1
CVN 75	TRUMAN	V	21853	9092	0867	009729378	147.46	1	2009	06	147.46	0.3	0.03899	1
CVN 75	TRUMAN	V	21853	9092	1092	011011949	27.27	4	2009	10	109.08	0.3242	0.551432	2
CVN 75	TRUMAN	V	21853	9092	1247	011263843	106.07	1	2009	10	106.07	5.3	0.027343	2
CVN 75	TRUMAN	V	21853	9092	1463	011569331	205.2	1	2009	07	205.2	0.25	0.020833	1
CVN 75	TRUMAN	V	21853	9093	0564	013066465	88.97	1	2009	06	88.97	0.24	0.00179	1
CVN 75	TRUMAN	V	21853	9093	0717	013358028	28.63	2	2009	07	57.26	0.05	0.000336	1
CVN 75	TRUMAN	V	21853	9093	0761	013454862	2208.54	1	2009	07	2208.54	0.03	0.023148	1
CVN 75	TRUMAN	V	21853	9093	0830	013592327	8.39	16	2009	07	134.24	0.006	0.001736	3
CVN 75	TRUMAN	V	21853	9093	1060	014302389	3152.14	1	2009	06	3152.14	3.29	1.273148	1
CVN 75	TRUMAN	V	21853	9093	1079	014387791	172.92	2	2009	10	345.84	0	0	2
CVN 75	TRUMAN	V	21853	9093	1279	015197443	66.39	1	2009	07	66.39	0.1	0.009259	1
CVN 75	TRUMAN	V	21853	9093	1311	015411468	36.73	2	2009	08	73.46	0.04	0.00085	2
CVN 76	REAGAN	R	22178	7275	0093	001000510	8.12	14	2007	11	113.68	0.24	0.003703	1
CVN 76	REAGAN	R	22178	7275	0181	001949702	2799.44	1	2007	11	2799.44	0.2	0.016927	1
CVN 76	REAGAN	R	22178	7275	0183	002010844	468.61	1	2007	11	468.61	0.1317	0.013183	1
CVN 76	REAGAN	R	22178	7275	0279	002722473	134.55	2	2007	11	269.1	0.34	0.078524	1
CVN 76	REAGAN	R	22178	7275	0302	002780230	203.96	2	2007	11	407.92	5.86	0.092592	1
CVN 76	REAGAN	R	22178	7275	0363	002853373	122.59	1	2007	11	122.59	0.11	0.006076	1
CVN 76	REAGAN	R	22178	7275	0473	003710378	758.49	2	2007	11	1516.98	0.2	0.029622	1
CVN 76	REAGAN	R	22178	7275	0495	004003193	1178.37	3	2007	11	3535.11	0.26	0.045166	1
CVN 76	REAGAN	R	22178	7275	0751	006015626	207.93	2	2007	12	415.86	0.01	0.001446	1
CVN 76	REAGAN	R	22178	7275	1046	010253159	2543.83	2	2007	11	5087.66	1	0.072337	1
CVN 76	REAGAN	R	22178	7275	1270	011283617	52.53	2	2007	11	105.06	0.23	0.02539	1
CVN 76	REAGAN	R	22178	7275	1356	011492022	822.72	1	2007	11	822.72	0.035	0.006875	1
CVN 76	REAGAN	R	22178	7276	0029	012268522	1469.98	1	2007	11	1469.98	0.92	0.105034	1
CVN 76	REAGAN	R	22178	7276	0284	013518969	19.54	1	2007	11	19.54	0.76	0.004353	1
CVN 76	REAGAN	R	22178	7276	0380	014374949	8849.98	1	2007	11	8849.98	0.5	0.052083	1
CVN 76	REAGAN	R	22178	7276	0423	014625783	12.66	15	2008	01	189.9	0.06	0.001302	1
CVN 76	REAGAN	R	22178	7276	0443	014651785	8212.94	2	2007	12	16425.88	1.75	0.069444	1
CVN 76	REAGAN	R	22178	9185	0191	012259236	273.59	2	2010	02	547.18	0.5	0.012152	1
CVN 76	REAGAN	R	22178	0070	1437	002374959	2.39	24	2010	09	57.36	0.02	0.00749	1
CVN 76	REAGAN	R	22178	0071	0188	010855174	451.2	1	2010	09	451.2	3	0.130667	2
CVN 76	REAGAN	R	22178	0071	0621	015026540	1050.15	1	2010	09	1050.15	1.45	0.038194	2

Table 14.   Offload Document Category Determinations and Associated Data

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